

11.0 APPENDICES

Appendix A. MRFSS Economic Add-On Question for Dolphin Management (Source: MRFSS 1999).

Management for Dolphins

For the species you listed as target species (in this case dolphin), indicate which of the following conservation measures you prefer?

Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	1,737	26.7	1,737	26.7
Maximum Size	427	6.6	2,164	33.3
Bag Limit	2,148	33.0	4,312	66.3
Diff Seasonal Limit	344	5.3	4,656	71.6
Areal Restriction	131	2.0	4,787	73.6
Limit Who Can Fish	169	2.6	4,956	76.2
No Preference	1,073	16.5	6,029	92.8
DK	438	6.7	6,467	99.5
R	33	0.5	6,500	100.0
Frequency Missing = 1				

Management for Dolphins

State of Intercept = Florida				
Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	1,033	27.0	1,033	27.0
Maximum Size	280	7.3	1,313	34.3
Bag Limit	1,275	33.3	2,588	67.6
Diff Seasonal Limit	215	5.6	2,803	73.2
Areal Restriction	71	1.9	2,874	75.1
Limit Who Can Fish	96	2.5	2,970	77.6
No Preference	591	15.4	3,561	93.0
DK	243	6.3	3,804	99.4
R	24	0.6	3,828	100.0
Frequency Missing = 1				

Management for Dolphins				
State of Intercept = Georgia				
Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	61	22.9	61	22.9
Maximum Size	23	8.6	84	31.6
Bag Limit	68	25.6	152	57.1
Diff Seasonal Limit	12	4.5	164	61.7
Areal Restriction	11	4.1	175	65.8
Limit Who Can Fish	7	2.6	182	68.4
No Preference	53	19.9	235	88.3
DK	31	11.7	266	100.0

Management for Dolphins				
State of Intercept = South Carolina				
Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	217	27.0	217	27.0
Maximum Size	47	5.9	264	32.9
Bag Limit	251	31.3	515	64.1
Diff Seasonal Limit	36	4.5	551	68.6
Areal Restriction	19	2.4	570	71.0
Limit Who Can Fish	24	3.0	594	74.0
No Preference	160	19.9	754	93.9
DK	46	5.7	800	99.6
R	3	0.4	803	100.0

Management for Dolphins				
State of Intercept = North Carolina				
Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	426	26.6	426	26.6
Maximum Size	77	4.8	503	31.4
Bag Limit	554	34.6	1,057	65.9
Diff Seasonal Limit	81	5.1	1,138	71.0
Areal Restriction	30	1.9	1,168	72.9
Limit Who Can Fish	42	2.6	1,210	75.5
No Preference	269	16.8	1,479	92.3
DK	118	7.4	1,597	99.6
R	6	0.4	1,603	100.0

Management for Dolphins				
Mode = Shore				
Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	538	24.0	538	24.0
Maximum Size	164	7.3	702	31.3
Bag Limit	681	30.3	1,383	61.6
Diff Seasonal Limit	140	6.2	1,523	67.8
Areal Restriction	78	3.5	1,601	71.3
Limit Who Can Fish	58	2.6	1,659	73.9
No Preference	404	18.0	2,063	91.9
DK	172	7.7	2,235	99.6
R	10	0.4	2,245	100.0

Management for Dolphins				
Mode = Charter				
Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	333	29.3	333	29.3
Maximum Size	71	6.2	404	35.5
Bag Limit	406	35.7	810	71.2
Diff Seasonal Limit	66	5.8	876	77.0
Areal Restriction	18	1.6	894	78.6
Limit Who Can Fish	29	2.6	923	81.2
No Preference	146	12.8	1,069	94.0
DK	65	5.7	1,134	99.7
R	3	0.3	1,137	100.0

Management for Dolphins				
Mode = Private/Rental				
Management Measure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Minimum Size	866	27.8	866	27.8
Maximum Size	192	6.2	1,058	33.9
Bag Limit	1,061	34.0	2,119	68.0
Diff Seasonal Limit	138	4.4	2,257	72.4
Areal Restriction	35	1.1	2,292	73.5
Limit Who Can Fish	82	2.6	2,374	76.1
No Preference	523	16.8	2,897	92.9
DK	201	6.4	3,098	99.4
R	20	0.6	3,118	100.0
Frequency Missing = 1				

Appendix B. Exploratory Dolphin Stock Assessment (Prager, 2000).

Exploratory Assessment of Dolphinfinch, *Coryphaena hippurus*,
based on U.S. Landings from the Atlantic Ocean and Gulf of Mexico

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Abstract

The dolphinfish *Coryphaena hippurus* is a large, fast-swimming fish found worldwide in tropical and subtropical ocean waters. Dolphinfish are top-level predators that grow rapidly and mature in less than one year. The species supports both commercial and recreational fisheries in U. S. waters and in other national and international waters of at least 20°C. The current stock hypothesis, of one stock in the Gulf of Mexico and South Atlantic, plus a second stock ranging south in the Caribbean Sea from the Virgin Islands, was provisionally accepted for this report.

Through reanalysis of growth data and application of empirical methods, the annual rate of natural mortality M was estimated as about 0.68 to 0.80 per year. Such values are similar to those accepted for yellowfin tuna, another wide-ranging, fast-growing, predatory species found in warm ocean waters.

An index of relative abundance was developed on data from the U.S. longline fishery, and the index was used to fit a surplus production model. Model results include estimated MSY of about 12,000 mt/yr; estimated F_{MSY} of about 0.5/yr; and estimated stock status at the start of 1998 as above B_{MSY} . These results are plausible but uncertain; the uncertainty being due primarily to the abundance index, whose accuracy is unknown. A more fundamental source of uncertainty is the scarcity of information on stock structure.

For comparison, proxies for reference points were also computed. Based on the above estimates of M , the proxy estimate of F_{MSY} is about 0.5 to 0.8 per year. Based on an average of recent landings, a proxy estimate of MSY is about 7,200 to 8,100 mt/yr. It is not known whether the production-model estimates or these proxies are more accurate.

The benchmark and proxy estimates and the life history of dolphinfish suggest that it might be able to withstand a relatively high rate of exploitation. However, results are exploratory and uncertain, and no good index of relative abundance yet exists. In addition, U.S. data are unlikely to encompass the entire hypothesized stock.

The most important research needed to improve assessment includes studies of stock structure, studies of current vital rates, and modeling studies on abundance indices. A fishery-independent source of relative abundance information would be extremely valuable. International cooperation could potentially leverage U.S. efforts and improve data coverage of this transnational stock. With added research to rely on, future assessments of this resource could be more definitive.

1 Introduction

The dolphinfish¹ *Coryphaena hippurus* is a large, fast-swimming fish found worldwide in tropical and subtropical ocean waters. The species supports commercial and recreational fisheries in North Atlantic waters off the United States and in the Gulf of Mexico; those fisheries have been described by Thompson (1999). A synopsis of available biological information is provided by Palko et al. (1982), who describe the species thus: “dolphins are top-level predators, very agile, and capable of taking fast-moving prey.”

The species is considered highly desirable for food, and it is widely sought by fishermen for food and recreation. Distribution is limited to the warm side of the 20°C isotherm, and dolphinfish are caught in suitable waters across the Atlantic basin, in the Gulf of Mexico, and in the Mediterranean Sea.

Accurate assessment of dolphinfish in U.S. waters is hindered by several factors. There is no statistics program in place specifically aimed at sampling the species, although records of dolphinfish appear in NMFS longline logbook, weighout, and MRFSS databases, and in data from other programs as well. However, the geographical sampling extents of those databases are not ideal for dolphinfish. Most (about 80% to 90%) of the landings are in recreational fisheries, which are usually more difficult to sample than commercial fisheries. The degree of dead discarding and live-release mortality is not well known. Stock structure is still uncertain, as discussed below. Most vital rates have not been reliably estimated, or the applicability of existing estimates is uncertain because of doubts about stock structure. Thus, it is doubtful that a meaningful catch-at-age matrix could be constructed. Recognizing this limitation, in this report a non-age-structured assessment model (surplus production model) is used for assessment purposes.

2 Stock Structure

Based on seasonal patterns in catch and on genetic observations, Oxenford and Hunte (1986) postulated a two-stock structure for dolphin in the western Atlantic. Under this hypothesis, a southern stock is found east and north of South America and extending northward to the Virgin Islands. Above the Virgin Islands, starting roughly at Puerto

¹The common name preferred by AFS (1980) is dolphin; others include mahi-mahi, dorado, and dolphinfish. The last is used here to avoid potential confusion with marine mammals,

Rico and extending north to North Carolina and north along the U.S. Atlantic coastline, the northern stock is found. Analyses in this report are made under this two-stock hypothesis and are concerned only with the northern stock.

Because the distribution of dolphin is basin-wide (given suitable temperatures), an analysis of fish caught off the United States is probably not sufficient to accurately characterize population dynamics of even this northern stock. At the least, data from Caribbean nations such as Cuba and Jamaica will be missing; if the stock extends to the eastern Atlantic, data from the eastern side of the basin will be missing. Furthermore, it is not known whether dolphinfish in the Gulf of Mexico should be considered part of the northern stock. In this report, they are so considered, but this assumption is made in the absence of data and so is an important source of uncertainty.

3 Vital Rates

The vital rates (growth, maturity, fecundity, mortality) of a stock offer insights into the degree of exploitation that it might endure without undue stock decline. As well as being used directly in data-intensive analyses such as spawning-stock biomass per recruit analysis, yield per recruit analysis, and sequential population analysis (VPA and similar analyses), information on vital rates and other life-history characteristics can be helpful in judging the permissible degree of exploitation in information-poor situations. From maturity, fecundity and growth patterns, one can form at least a qualitative impression of the likely response of a stock to exploitation. In addition one can compare a species to other species of similar life history about which more is known, or at least experience of which is more extensive.

In such a life-history approach, one generally expects that a relatively infecund, slow-maturing species can sustain a lesser degree of exploitation than a relatively fecund, early-maturing species. Examples of the former group would be most shark species; of the latter, species such as tropical tunas and menhadens. A notable exception to this general picture is that small, fast-growing, planktivorous species in coastal upwelling zones have been prone to drastic population crashes: a conspicuous example is the California sardine *Sardinops sagax* (MacCall 1979). However, fast-growing, early-maturing, predatory species that are more oceanic in distribution have not experienced such crashes, despite many decades of at least moderately intensive exploitation. This does not preclude the possibility of a crash under some excessive level of exploitation

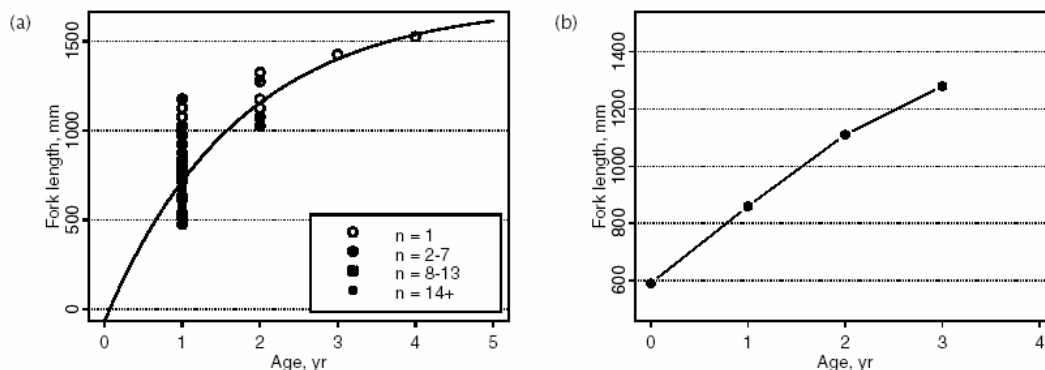


Figure 1. Data from published growth studies on dolphinfish with newly fitted von Bertalanffy growth functions. (a) Beardsley (1967); (b) Rose and Hassler (1968).

that might be reached in future.

3.1 Growth

Growth of dolphinfish is rapid. Beardsley (1967) examined 511 dolphin from waters off south Florida ranging in size from 475 to 1,525 mm fork length (FL). Of the 1-year-olds, the size range was 475 to 1,175 mm FL. No growth model was fitted in that study. In the present study, to provide values for use in empirical estimates of mortality rates (described in §3.3 below), a von Bertalanffy growth function

$$L_t = L_\infty \left(1 - \exp(-K(t - t_0)) \right) \quad (1)$$

was fit to the grouped length-at-age data of Beardsley (1967) as read from his Fig. 5. The resulting growth function is

$$L_t = 1710 \left(1 - \exp(-0.583[t - 0.07]) \right), \quad (2)$$

and it appears to describe the sizes at age of those specimens reasonably well (Fig. 1a). Some of the dispersion apparent in Fig. 1a stems from the practice of reporting fish ages as integers, thus not accounting for growth increments less than one year; the scatter would presumably be less if ages were recorded to the nearest month or sizes were back-calculated to size at the time of formation of the last annulus.

A second relevant growth study was based on samples from the recreational charter-boat fishery off Hatteras, North Carolina. Rose and Hassler (1968) examined 738 specimens during the 1961 through 1963 fishing seasons. Age determination was by scale reading; the oldest fish observed was 3 yr old (more precisely, under 4 yr old, as 3 but not 4 annuli were observed). Rose and Hassler (1968) fitted several models, including a length-weight model and a model relating body length to scale length, but they did not fit a standard growth model. As part of the present study, the grouped size-at-age data were read from their Fig. 3 and a von Bertalanffy model was fit. The resulting estimated growth function (Fig. 1b) is

$$L_t = 2459 \left(1 - \exp(-0.158(t + 1.74)) \right). \quad (3)$$

Statistical details for reanalysis of the two data sets were similar. Distribution of size at age was discernible from Beardsley (1967), but not from Rose and Hassler (1968), so for reanalysis of that study's data, a single size (the reported mean) was used for each age. In each reanalysis, recorded sizes were statistically weighted by sample sizes reported by the original authors.

Both reports truncated all ages to integer, without any attempt to estimate true age by examining growth since the last annulus or by considering month of collection. The effect of such truncation is loss of precision in the estimates of the von Bertalanffy growth parameters and likely bias in the estimate of t_0 . The truncation would not be expected to bias estimates of K or L_∞ directly.

The growth curves corresponding to the two studies are somewhat different (Fig. 1. Because fish examined by Rose and Hassler (1968) were on average younger than those examined by Beardsley (1967), the former study may not describe size of older fish as well, and its estimate of asymptotic length L_∞ may not as closely reflect the overall maximum length of older fish in the stock.

The growth curves estimated here describe slower patterns of growth than that reported by Oxenford and Hunte (1983) from Barbados. That is not surprising, because fish in North Carolina and Florida waters are part of the presumed northern, rather than southern, stock, and they live in colder waters. For purposes of this report, the two sets of growth parameters estimated from U.S. waters seem more relevant.

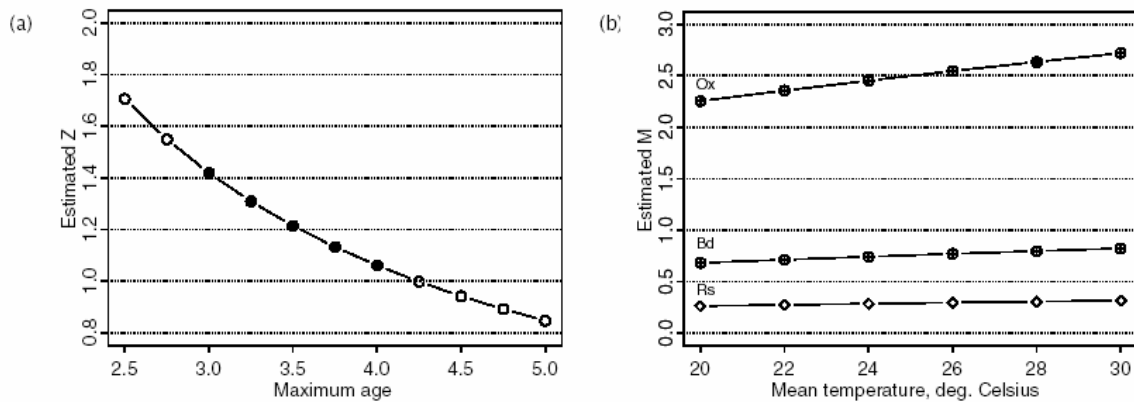


Figure 2. Empirical estimates of mortality rates for dolphinfish. (a) Estimates of total mortality rate Z from maximum observed age t_{∞} by method of Hoenig (1983). Filled circles reflect range of t_{∞} reported in literature. (b) Estimates of natural mortality rate M from growth parameters and average water temperature. Curve Ox is based on Oxenford and Hunte's estimates from Barbados; curve Be is based on growth data from Florida waters (Beardsley 1967) and reanalyzed here; curve Rs is based on growth data from NC waters, (Rose and Hassler 1968) and reanalyzed here.

3.2 Maturity and Fecundity

No analysis of reproductive biology was made for this report. Nonetheless, in considering the species' overall life history, a few key points from Beardsley (1967) will be summarized. In Florida waters, both sexes reach sexual maturity in the first year of life. The spawning season is extended, and multiple spawning may be common in both sexes. Total egg production per female is 240,000 to nearly 3 million eggs per year for a range of sizes from 500 mm to 1,100 mm FL. Rose and Hassler (1968) found that, of those they examined, few of the 2-year-old fish and none of the 3-year-old fish were females, but they attributed this sexual differential to "differential feeding habits of the sexes," leading to biased sampling (towards males) in their study, which used hook-and-line gear, rather than a population sex ratio different from unity. Other studies of reproductive biology are summarized in Palko et al. (1982).

3.3 Mortality Rates

Only one direct estimate of mortality rate was located in the literature. Bentivoglio (1988) used a Robson-Chapman estimator to estimate total mortality in the Gulf of Mexico Z at about 8.2/yr. That value does not seem feasible for dolphinfish in the Atlantic, where Beardsley (1967) found one 4-yr-old fish in a sample of 511. Assuming random

Table 1. Estimates of instantaneous rate of total mortality and corresponding annual survival fraction; method of Hoenig (1983).

Maximum age, yr	Total mortality rate Z	Survival fraction S
2.50	1.71	0.18
2.75	1.55	0.21
3.00	1.42	0.24
3.25	1.31	0.27
3.50	1.21	0.30
3.75	1.13	0.32
4.00	1.06	0.35
4.25	1.00	0.37
4.50	0.94	0.39
4.75	0.89	0.41
5.00	0.85	0.43

sampling, the probability of finding so old a fish in a sample of 511 is approximately $511e^{-8.2 \cdot 4} = 2.9 \times 10^{-12}$, which can be considered very close to zero. The probability of finding a fish even 3 yr old would be about 1.1×10^{-8} . Thus, it is almost certain that either the estimate $\hat{Z} = 8.2$ is imprecise or inaccurate, that fish in the Gulf of Mexico have quite different vital rates from fish in the Atlantic, or that vital rates have changed dramatically through time. The following conclusion was reached by Bentivoglio (1988): "From all growth studies done in the Atlantic, the Gulf of Mexico dolphin population would seem to resemble the southern population as determined by Oxenford and Hunte (1986) [in having faster growth rates than fish in U.S. Atlantic waters.]."

Absent direct estimates, mortality rates are often estimated from other information using two empirical methods. The method of Pauly (1979) estimates natural mortality rate M from parameters L_∞ and K of the von Bertalanffy growth model and mean prevailing water temperature. The method of Hoenig (1983) estimates total mortality rate Z from the oldest age observed in a large sample, and is sometimes used to estimate M under the assumption that the sample comes from an unfished stock.

The two empirical methods were applied to approximate mortality rates of dolphinfish in the Atlantic (the northern stock). For the range of maximum ages reported in Beardsley (1967), Rose and Hassler (1968), and Oxenford and Hunte (1983) of 3 yr

Table 2. Estimates of instantaneous rate of annual natural mortality M as a function of growth parameters and mean water temperature; method of Pauly (1979). For key to study abbreviations, see caption to Fig. 2.

Mean water temp, °C	M from study Ox	M from study Be	M from study Ro
20	2.254	0.681	0.262
22	2.355	0.712	0.273
24	2.452	0.741	0.285
26	2.545	0.769	0.295
28	2.634	0.796	0.306
30	2.719	0.822	0.316

to 4 yr, the Hoenig (1983) method provides estimates of total mortality rate Z from 1.42/yr declining to 1.06/yr as the maximum observed age increases (Fig. 2a, Table 1). If the maximum age of 4 yr is interpreted to mean a fish from age class 4, i.e., a fish on average slightly older than 4 yr, the estimate of Z would be less than 1.06/yr (Table 1). These are estimates of Z at the time the oldest ages were observed, i.e., at the time of the studies cited.

Estimates of M by Pauly's method are specific to growth parameters and water temperature assumed. Estimates were made for a range of temperatures and three sets of von Bertalanffy growth parameters (Fig. 2b). The estimates based on the growth parameters of Oxenford and Hunte (1983) are presumably descriptive of the southern stock and are shown for comparison only. The two sets of estimates derived from growth parameters for the northern stock vary somewhat. Because the data of Beardsley (1967) included a wider range of sizes, a more even sex distribution, and resulted from more varied sampling techniques than the data of Rose and Hassler (1968), estimates from those data seem better suited to the purposes of this assessment.

Estimates of M based on the data of Beardsley (1967) are relatively high for such a large fish, but within the range of plausibility, given its high growth rate and early maturity. Over a range of mean water temperatures from 20° to 28°, corresponding estimates of M range from 0.68/yr to 0.80/yr (Fig. 2b; Table 2). For comparative purposes, this range of values is similar to accepted estimates of M for yellowfin tuna, another large, warm-water, wide-ranging, predatory fish. For that species, the values commonly used

are $M = 0.8$ for ages 0 and 1 and $M = 0.6$ for older fish (ICCAT 1991).

4 Abundance Index

An index of relative abundance was estimated from the weighout database maintained at the NMFS Southeast Fisheries Science Center in Miami. This database contains records of fishing effort (number of hooks set) and landings in weight for numerous species caught in the U. S. longline fishery. That data base was selected because of its wide data coverage and because the relative lack of targeting on dolphinfish might result in approximately random sampling, which in turn would provide an unbiased index of relative abundance. (By comparison, using data from a fishery in which dolphinfish are strongly targeted might tend to underestimate changes in relative abundance, because targeting, especially on a schooling species, can cause catchability to increase with declining abundance.)

To construct the abundance index, the weighout data compiled by Goodyear (1999) for the South Atlantic Fishery Management Council were used; those data include years 1986 through 1997. In a data screening step, the following records were removed:

- Records with gear other than longline, as such records could not be used in generating a standardized abundance index
- Records from NMFS areas 10, 11, 12, and 13, which are south of the area occupied by the hypothesized northern stock of dolphinfish
- Records showing no hooks set, as being typographic errors or simply incomplete information
- Records believed to be from sets targeting dolphinfish, as being nonrepresentative of overall abundance trends; such records are few and mainly in the last few years

Following screening, data were accumulated on a trip basis (defined by unique combinations of vessel ID, number of hooks set, location and logbook date),² with total weight of dolphin landed and total number of hooks set as the major variables compiled for analysis.

²Present practice is to apply a unique trip identifier in the weighout database. Because that practice was instituted only recently, other data were used here to define unique fishing trips.

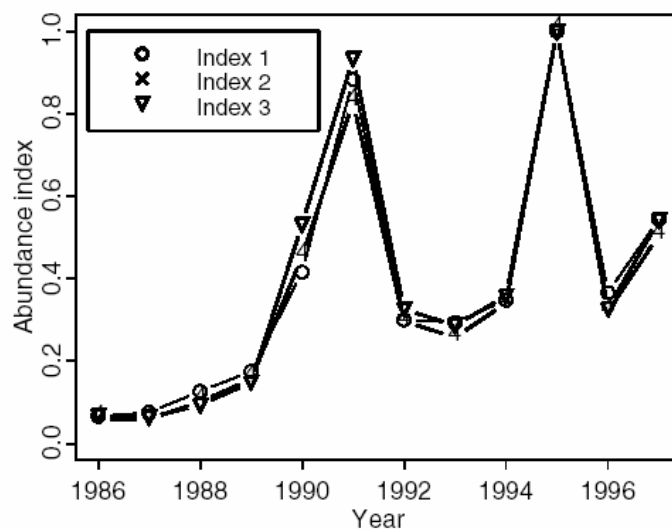


Figure 3. Preliminary indices of relative abundance of dolphinfish in U.S. waters. Indices vary by specific factors included in models. (See text for details.)

The abundance index itself was estimated through a statistical procedure similar to a linear model, but based on a delta-lognormal model (Lo et al. 1992; Zhou and Tu 1999). This procedure has been adopted in fisheries work for data sets with many cells with CPUE values of zero (Ortiz et al. 1999). Because the longline fishery is primarily directed at swordfish, not at dolphinfish, that was the case here.

Three indices were constructed, differing only in the effects estimated. Index #1 estimated effects only for year and general location of the catch (NMFS location code). Index #2 also estimated effects for an assigned *operation code* that classifies vessels into general groups by style and power of fishing. Index #3 omitted that operation code but added a seasonal effect (quarter of the year). The relative abundances (year effects) estimated by the three analyses were nearly identical (Fig. 3). Year effects from Index #1 were used in surplus production modeling (§5) and are given in the second column of Table 3.

Whether the estimated indices truly represent patterns of relative abundance is open to question: this analyst has limited confidence that they do. Inspection of Fig. 3 demonstrates that the estimated ratio between largest and smallest abundances within each index is about 15:1 and that the range of estimated abundances in recent years (1994–1997) is nearly 4:1. It is questionable whether dolphinfish have undergone such

Table 3. Data used in production model of dolphinfish *Coryphaena hippurus*. Relative abundance is in arbitrary units and derived from a delta-lognormal model; catch is the sum of commercial and recreational landings.

Year	CPUE	Catch, mt
1985	—	4,576.85
1986	0.06655	4,576.85
1987	0.07546	3,302.52
1988	0.12668	3,480.16
1989	0.17511	6,166.56
1990	0.41530	5,854.16
1991	0.88276	7,875.63
1992	0.30023	4,526.29
1993	0.29382	5,199.09
1994	0.34805	5,801.06
1995	1.00000	9,036.78
1996	0.36632	5,817.63
1997	0.54344	10,232.91

large and sudden changes in abundance; however the possibility cannot be dismissed. Moreover, the indices could be accurate (unbiased) but imprecise (noisy) because of poor representation of dolphinfish in the catch or for other reasons. With no corroborating evidence of population abundance patterns, one must say that uncertainty in the abundance indices is high.

5 Surplus Production Model

A surplus production model was fit to abundance index #1 and total landings as compiled by Goodyear (1999). Data used in modeling are given in Table 3. The model was fit with the computer program ASPIC (Prager 1995), which implements a non-equilibrium version of the logistic surplus production model of Lotka (1924) and Schaefer (1954, 1957) as revised by Pella (1967) and Prager (1994). Fits were also made with abundance indices #2 and #3, and because results were essentially the same, they are not presented here. The objective of fitting this model was to obtain estimates of stock status and reference points for management.

The surplus production model seems to fit the data reasonably well (Fig. 4a): it cap-

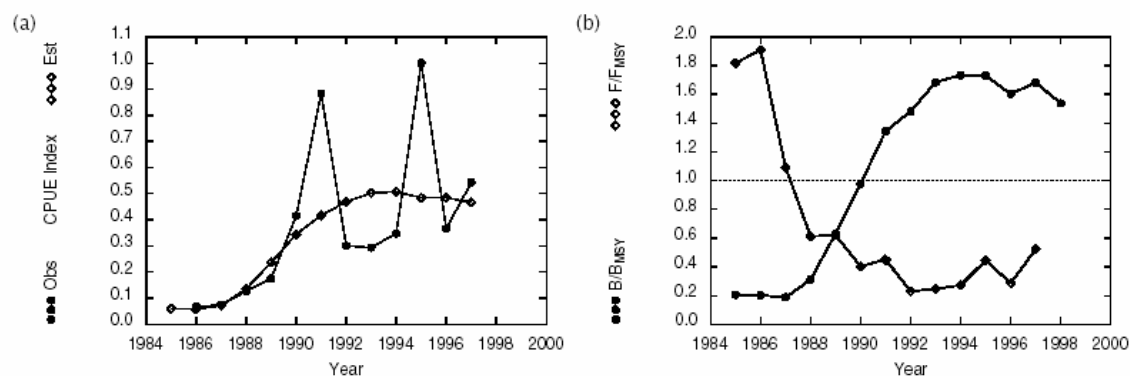


Figure 4. Surplus production model of dolphinfish, based on U.S. landings and long-line CPUE. (a) Fit of model to CPUE index. (b) Estimates of relative benchmarks B/B_{MSY} and F/F_{MSY} over time.

Table 4. Benchmark estimates from production model of dolphinfish in north Atlantic Ocean. Bias-corrected (BC) estimates shown, along with upper and lower bounds of nonparametric 80% confidence interval; all derived from bootstrapping.

Benchmark	BC estimate	80% LCB	80% UCB
MSY, mt/yr	12,241	8,506	21,110
F_{MSY} , proportion/yr	0.49	0.34	0.85
B_{1998}/B_{MSY}	1.56	1.22	1.77
F_{1997}/F_{MSY}	0.51	0.26	0.92

tures the overall pattern of change in the abundance index, though not the recent large fluctuations. Estimates from the model (Table 4) are plausible given the life history and catch record of the species. The confidence intervals in Table 4 should be regarded as minimum estimates; actual bounds of uncertainty are probably greater. Concern about uncertainty in these estimates springs from two related sources. First, as mentioned immediately above, the underlying abundance index is itself uncertain, and estimates from the production model can be no more certain than the data on which they are based. It is also notable that the model estimates low stock abundance at the start of the period (about 20% of B_{MSY} in 1985), followed by an increase of about 8 \times , to about 168% of B_{MSY} in 1997 (Fig. 4b). This pattern reflects that of the abundance index, although the model smoothes the variation somewhat. With no independent evidence at hand for comparison, it is difficult to know whether the estimate of low relative abundance in the mid

1980's is meaningful or an artifact. To judge sensitivity of the production model, additional runs were attempted with the first-year biomass fixed at higher fractions of B_{MSY} (fractions ranging from 0.2 to 0.6), but it was not possible to obtain estimates under that constraint. In summary, estimates from the production model seem plausible given the species' life history and recent landings, but can be considered no more certain than the estimated abundance indices upon which they are based.

6 Reference Points and Proxies

It has been recommended that limit reference points be specified as part of the information supplied for fishery management (FAO 1995; Restrepo et al 1998), and this approach has become increasingly important. The production model estimates above provide one set of estimates of limit reference points: $MSY = 12,241$ mt/yr and $F_{MSY} = 0.49$ /yr (Table 4). Because of uncertainty in those estimates, it seems desirable to seek another set of reference points for comparative purposes.

In data-limited situations, the use of proxies for MSY and F_{MSY} has been suggested, along with the necessity of "bringing the knowledge base at least up to data-moderate standards" (Restrepo et al 1998). The same document suggests that suitable proxies for F_{MSY} can lie between $F = 0.75M$ and $F = M$. Given the range of estimates of M developed in §3.3 ($0.68 \leq \hat{M} \leq .80$), the corresponding range of proxies would be $0.51 \leq F \leq 0.80$.

Restrepo et al (1998) also suggest that "if there is no reliable information to estimate fishing mortality or biomass reference points, it may be reasonable to use the historical average catch as a proxy for MSY , taking care to select a period when there is no evidence that abundance was declining." Using that approach, one could take an average of the last ten years' catch and arrive at a proxy for MSY of $Y = 7,204$ mt/yr. The choice of ten years is somewhat arbitrary, but the suggestion is to use a recent time period. If the last five years' catch are averaged, the proxy for MSY becomes $Y = 8,089$ mt/yr.

The benchmark estimates from the surplus production model and their proxy counterparts are comparable, but the production model estimates that a larger sustainable yield might be possible through application of a lower rate of fishing mortality. Unfortunately, current knowledge does not allow a scientific statement about which set of benchmarks is closer to the truth.

7 Summary of Stock Status

The life history of dolphinfish and the estimates generated here suggest that this species may be able to withstand a relatively high rate of exploitation. The abundance index indicates an increasing trend in stock size, and the surplus production model based on that index estimates that recent (start of 1998) stock status is above B_{MSY} . These positive indications are balanced by abundant uncertainty and reasons for caution:

1. Under excessive mortality rates, even a species resistant to exploitation may undergo geographically or temporally localized depletion or be exploited at suboptimal yield per recruit.
2. The current stock hypothesis is supported by only limited evidence.
3. The stock status of fish in the Gulf of Mexico is unknown. Here, they have been assumed to belong to the northern stock. Based on vital rates estimated for the two areas, that assumption may be incorrect.
4. Under the current stock hypothesis, extent of the stock include waters of other nations, so that international cooperation in research, monitoring, and assessment appears necessary to obtain more complete catch records and to delineate stock boundaries.
5. Estimates of vital rates are several decades old.
6. The abundance index is quite uncertain and lacks corroboration.

8 Research Needs

Assessment of dolphinfish is limited by lack of information. Critical areas for further investigation are

- Better definition of stock structure
- More research on vital rates
- Further research on appropriate indices of abundance

While research on these items can be conducted in parallel, it is a fundamental tenet that scientific assessment depends on proper definition of stock structure (Pitcher and Hart 1982). It is exceedingly difficult to interpret apparent changes in abundance when the fish under study may represent an unknown number of stocks, each of unknown extent.

All methods of assessment depend to some degree on estimates of vital rates. At the very least, yield per recruit cannot be estimated accurately without good estimates of growth and M ; these are also needed for age-structured methods. Estimates of spawning potential and proxy estimates of F_{MSY} depend on knowledge of vital rates. Finally, even when they are not used directly in assessment models, comparison to current vital rates provides perspective to benchmark estimates.

Development of abundance indices for widely dispersed and poorly sampled species is not a simple endeavor. Development so far has been limited by time and manpower. More fundamentally, it is not certain whether the available data, which are mostly fishery dependent, are unbiased (for the population, not the catch) and have sufficient coverage. A fishery-independent measure of abundance would be a valuable tool, especially for a species such as dolphinfish, which tends to aggregate in surface waters and so is subject to targeting.

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Appendix C. Purpose and Need (Section 1.0), Affected Environment (Section 5), Description of the Pelagic Longline Fishery for HMS (Section 6.0), and HMS Action to reduce bycatch and incidental catch in the Final Supplemental Environmental Impact Statement for the Regulatory Amendment to the Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan to Address Reduction of Bycatch and Incidental Catch in the Atlantic Pelagic Longline Fishery (NMFS, 1999b).

**FINAL
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT**

**REGULATORY AMENDMENT 1 TO THE
ATLANTIC TUNAS, SWORDFISH, AND SHARKS
FISHERY MANAGEMENT PLAN**

**REDUCTION OF BYCATCH, BYCATCH MORTALITY,
AND INCIDENTAL CATCH
IN THE ATLANTIC PELAGIC LONGLINE FISHERY**

*(Includes Final Supplemental Environmental Impact Statement,
Regulatory Impact Review, and Final Regulatory Flexibility Analysis)*

Revised
June 14, 2000

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Sustainable Fisheries
Highly Migratory Species Division
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Silver Spring, MD 20910
(301) 713-2347
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Reduction of Bycatch, Bycatch Mortality, and Incidental Catch in the Atlantic Pelagic Longline Fishery

- Final Action:** Implement time/area closures in the Gulf of Mexico and South Atlantic Bight/East Florida Coast and prohibit use of live bait in the Gulf of Mexico by pelagic longline fishermen who hold federal highly migratory species permits. The final rule will be published by August 1, 2000.
- Type of statement:** Final Documents: Supplemental Environmental Impact Statement, Social Impact Assessment, Regulatory Impact Review, and Regulatory Flexibility Analysis
- Lead Agency:** National Marine Fisheries Service: Office of Sustainable Fisheries
- For further information:** Rebecca Lent
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Abstract: The intent of these final actions is to reduce the occurrence of bycatch and incidental catch by U.S. commercial fishermen who hold Federal highly migratory species permits and use pelagic longline gear in the Atlantic Ocean. The final action would amend the Highly Migratory Species Fishery Management Plan by establishing time and area closures and gear restrictions to pelagic longline fishing to reduce the bycatch and bycatch mortality of highly migratory species, threatened or endangered turtle species, and the incidental catch of marine mammals and sea birds. This action minimizes the reduction in target catches of tuna, swordfish, and other commercially-viable species. The final action prohibits the use of pelagic longline gear year-round in an area of the northeastern Gulf of Mexico (DeSoto Canyon) and an area along the east coast of Florida (East Florida Coast). A third area located off Georgia, South Carolina and a portion of North Carolina (Charleston Bump) is closed to pelagic longline gear during February through April. In addition, this final action prohibits the use of live bait on pelagic longline gear used in the Gulf of Mexico. These measures address objectives in the Highly Migratory Species Fishery Management Plan and Amendment One of the Atlantic Billfish Fishery Management Plan, consistent with National Standard 9 of the Magnuson-Stevens Fishery Conservation and Management Act.

Alternatives considered for managing bycatch and incidental catch from pelagic longlines ranged from no action to a total prohibition of the use of pelagic longline gear. In addition to time/area closures, alternatives examined include limiting the gear soak time, requiring circle hooks, and other gear-based actions.

1.0 PURPOSE AND NEED FOR ACTION

1.1 General

This final rule implements time/area closures and gear restrictions for pelagic longline gear deployed by U.S.-flagged vessels in the Atlantic Ocean to reduce pelagic longline bycatch, bycatch mortality, and incidental catch, consistent with National Standard 9 (NS9). Pelagic longline gear is the dominant commercial fishing gear used by U.S. fishermen in the Atlantic Ocean to target highly migratory species (HMS). Further, it is a common commercial fishing gear used by vessels from many other nations in the Western Atlantic Ocean. Pelagic longline fishing by U.S. commercial fishermen is conducted offshore of the Atlantic and Gulf Coasts, in the Caribbean basin and South Atlantic Ocean, with a significant proportion of fishing effort occurring within the U.S. Exclusive Economic Zone (EEZ). Management of the U.S. pelagic longline fishery in the Atlantic Ocean and surrounding waters has historically relied upon a catch or landing quota and/or a minimum size limits. The National Marine Fisheries Service (NMFS) closely monitors the United States pelagic longline fleet through observer and logbook programs; a vessel monitoring program (VMS) is scheduled for implementation in the pelagic longline fishery on September 1, 2000.

Pelagic longline gear can be modified (gear type and configuration, timing of sets, etc.) to target yellowfin tuna, bigeye tuna, sharks, or swordfish. However, this gear also catches other species (or sizes) of fish (e.g., marlin, sailfish, undersized swordfish), mammals (porpoises or whales) that are either hooked or entangled, sea birds, and sea turtles that are not the gear's targets. Many of the species are not kept because they cannot be legally retained due to species prohibitions, minimum size limits, quotas, or other regulations (i.e., *regulatory discards*), and in these cases, animals must be released in a manner intended to maximize survival. However, there can be significant mortality of the bycatch as a result of the interaction with pelagic longline gear. In other instances, species are not kept *by choice*, due to market value, hold capacity, or for a myriad of other reasons.

Bycatch and bycatch mortality of billfish, undersized swordfish, and sea turtles has been a particular concern for many years because of its impact on the stocks of these species. In September 1997, NMFS released the first report entitled "A Report to Congress: Status of Fisheries in the United States." This report designated North Atlantic swordfish, Atlantic blue marlin, Atlantic white marlin, bluefin tuna, and the large coastal shark (LCS) complex as overfished; west Atlantic sailfish and bigeye tuna were added to the overfished stocks list in 1998 and northern albacore tuna was added in 1999. Further, several sea turtle stocks are listed as either endangered or threatened (see Section 5).

1.2 What is Bycatch and Incidental Catch?

Bycatch has become a central concern of fishing industries, environmentalists, resource managers, scientists, and the public, both nationally and globally. A 1994 report of the Food and Agriculture Organization (FAO) of the United Nations estimated that nearly one-quarter (27

million metric tons (mt)) of the total world catch by commercial fishing operations was discarded (Alverson *et al.*, 1994). Bycatch precludes other more productive uses of fishery resources; it is important to minimize the waste associated with bycatch when so many of the world's fisheries are either fully exploited or overexploited. As a source of fishing mortality, excessive bycatch in commercial fisheries can slow rebuilding of overfished stocks (if most of the bycatch dies) and imposes direct and indirect costs on commercial fishing operations by increasing sorting time, and decreasing the amount of gear available to catch target species. Bycatch concerns also apply to populations of marine mammals, sea turtles, seabirds and other components of ecosystems for which there are no commercial or recreational uses.

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) defines bycatch as:

fish that are harvested in a fishery, but are not sold or kept for personal use, and includes economic discards and regulatory discards. [Bycatch] does not include fish released alive under a recreational catch and release fishery management program.

Some relevant examples of fish that are included in the Magnuson-Stevens Act's definition of bycatch are Atlantic billfish caught and discarded by commercial fishing gear (even if tagged and released); undersized swordfish; and bigeye and yellowfin tunas caught and discarded by commercial fishermen; species for which there is little or no market and which are therefore discarded, such as blue sharks; and other highly migratory species that are not landed for various reasons (including fish hooked and lost, or fish released at the boat - whether or not the fish was tagged). Bycatch also includes the release of prohibited shark species and LCS caught by pelagic longline gear during a closure of that fishery. The recreational fishery can also have bycatch, including both regulatory discards (fish caught below minimum size limits or in excess of bag limits, e.g., 27 inch minimum size for yellowfin tuna with a three-fish per person per trip bag limit), and selective discards of fish that could legally be retained. However, bycatch does not include Atlantic HMS harvested in a commercial fishery that are *not* regulatory discards and that are tagged and released alive under a scientific tag-and-release program. Recreationally caught billfish and white sharks are now part of a catch-and-release program under the Fishery Management Plan for Atlantic Tunas, Sharks, and Swordfish (HMS FMP) and Amendment One to the Atlantic Billfish Fishery Management Plan (Billfish FMP Amendment) and as such, are not considered bycatch.

Incidental catch is the catch of those animals that are caught incidental to fishing operations that may or may not be discarded, e.g., bluefin tuna caught on a pelagic longline gear. Incidental catch also includes marine mammals and sea birds which are discarded but are not included in the Magnuson-Stevens Act definition of bycatch. NMFS focuses this rulemaking not only on bycatch as defined by the Magnuson-Stevens Act but on all discarded animals.

NMFS initiated efforts to address the issue of bycatch of finfish and turtles and incidental catch of marine mammals in 1997 through the development and publication of the HMS FMP and

Billfish FMP Amendment. These documents provide detailed discussions of bycatch and incidental catch issues associated with the various HMS commercial and recreational fisheries. The HMS FMP and its associated consolidated rule include several measures to reduce bycatch, including a time/area closure for pelagic longline fisheries to reduce discards of bluefin tuna, limited access for swordfish and shark fisheries, proposed quota reductions that serve as part of the foundation for international negotiations, gear restrictions (e.g., the ban on drift gillnets for tuna fishing as a result of frequent encounters with marine mammals and other protected species), and outreach programs (e.g., providing information on the impacts of circle hooks, live vs. dead bait, etc.). Further, the Billfish FMP Amendment defers management of billfish bycatch in commercial HMS fisheries to the plan that manages the directed fisheries in which billfish bycatch occurs; namely the HMS FMP.

The HMS FMP indicated that time and area closures could be a useful tool to reduce bycatch and bycatch mortality in the pelagic longline fishery in the short term. The HMS FMP included a time/area closure for pelagic longline fishermen to address bluefin tuna incidental catch. Although the draft HMS FMP proposed a time/area closure in the Florida Straits aimed at reducing undersized swordfish bycatch, public comment indicated that the closure was likely too small to be effective, and was not comprehensive with respect to the incidental catch of other species. NMFS agreed with the comments and did not finalize the Florida Straits closure, instead opting to develop a more effective closure, together with pelagic longline gear restrictions, to address bycatch issues, which is the purpose of this final rule.

1.3 Objectives of the Final Action

The following objectives were developed to guide agency action, to the extent practicable, to reduce bycatch, bycatch mortality, and incidental catch of undersize swordfish, billfish, and other overfished and protected species from the U.S. pelagic longline fishery operating in the Atlantic Ocean:

- (1) Maximize the reduction in finfish bycatch;
- (2) Minimize the reduction in the target catch of swordfish and other species;
- (3) Consider impacts on the incidental catch of other species to minimize or reduce incidental catch levels; and
- (4) Optimize survival of bycatch and incidental catch species.

This rulemaking is also consistent with the objectives of the HMS FMP and the Billfish FMP Amendment. It particularly addresses the objective of the HMS FMP “to minimize, to the extent practicable, bycatch of living marine resources and the mortality of such bycatch that cannot be avoided in the fisheries for Atlantic tuna, swordfish, and sharks.” Although the Billfish FMP Amendment defers management of commercial fishing bycatch to the HMS FMP, it does state an objective of that plan is to “...minimize to the extent practicable, bycatch and discard mortality of billfish on gears...” Further, to the extent that these actions reduce mortality levels of overfished resources, particularly of pre-reproductive fish and spawning populations, these objectives will augment rebuilding efforts initiated in the HMS FMP and Billfish FMP Amendment.

1.4 Endangered Species Act and Marine Mammal Protection Act

The Endangered Species Act (ESA) is the primary Federal legislation governing interactions between fisheries and species whose continued existence is threatened or endangered. Through a consultative process, this law requires Federal agencies to evaluate proposed actions in light of the impacts they could have on these ESA-listed species. In the case of marine fisheries, NMFS' Office of Sustainable Fisheries (OSF) consults with the NMFS Office of Protected Resources (OPR) and the U.S. Fish and Wildlife Service to determine what impacts major fishery management actions will have on threatened and endangered populations of marine species and what actions can be taken to reduce or eliminate negative impacts. Under the formal consultative process, NMFS issues a Biological Opinion (BO) which outlines expected impacts of the proposed action and specifies the reasonable and prudent alternatives to avoid jeopardy or, if the action does not jeopardize threatened or endangered species, specifies reasonable and prudent measures to minimize impacts of any incidental take of the endangered or threatened species (see Section 5.8).

The Marine Mammal Protection Act (MMPA) of 1972 is the principal Federal legislation that guides marine mammal species protection and conservation policy. Under requirements of the MMPA, NMFS produces an annual List of Fisheries that classifies domestic commercial fisheries by gear type relative to their rates of incidental mortality or serious injury of marine mammals. The Atlantic pelagic longline fishery for HMS is considered a Category I fishery, which indicates that this gear is associated with frequent serious injury or mortality to marine mammals. Fishermen participating in Category I fisheries are required to be registered under the MMPA and, if selected, to accommodate an observer aboard their vessels. Vessel owners or operators in Category I fisheries must report to NMFS all incidental mortalities and injuries of marine mammals during the course of commercial fishing operations.

1.5 Advisory Panel Deliberation and Public Comment

As a result of the re-authorization of the Magnuson-Stevens Act, an HMS Advisory Panel (AP) and an Atlantic Billfish AP were formed during 1997. These panels consist of members from recreational, commercial, environmental, and scientific communities, as well as from state fisheries agencies, the five Atlantic Fishery Management Councils, and the International Commission for the Conservation of Atlantic Tuna (ICCAT) Advisory Committee. NMFS held a joint HMS-Atlantic Billfish AP meeting during the development of the FMPs in July 1997 to expressly evaluate bycatch issues and options. The discussion focused on possible time/area closures and gear restrictions and/or gear modifications. The draft HMS FMP and draft Billfish FMP Amendment issued in October 1998 included a time/area closure in the Florida Straits to pelagic longline fishing activity during the months of July, August, and September as part of a management strategy to reduce bycatch of undersized swordfish and Atlantic billfish. NMFS received numerous comments concerning the use of time/area closures for the pelagic longline fishery. A range of comments supported the proposed Florida Straits closure, other nursery areas (for swordfish in particular) such as the Charleston Bump and areas in the Gulf of Mexico, and a year-round ban of pelagic longline gear. Comments also opposed any time/area closure that

would have unpredictable results due to redistributed effort. Specific to the proposed area in the Florida Straits, many comments indicated that the area was too small to have the desired conservation effect because fishermen would redistribute their effort along the fringe of the closed areas.

After considering these comments, NMFS agreed and deferred the implementation of a time/area closure for protection of undersized swordfish and billfish pending further analyses of the impacts of effort redistribution, and increased effectiveness with temporal and/or spatial expansion of the time/area management window. Further rationale for the delay was based on the potential magnitude of the economic and social impacts that would likely result from a more extensive time/area closure. Consistent with the delay in the implementation of additional time/area closures in the pelagic longline fishery, NMFS delayed until September 1, 2000, the requirement for all commercial vessels with pelagic longline gear on board to have a NMFS-approved vessel monitoring system.

In June 1999 and again in February 2000, NMFS met with the HMS and Atlantic Billfish APs on various time/area strategies. The latter meeting was to solicit comments on the proposed rule (published December 15, 1999). NMFS considered comments by the APs in the development of this document and the accompanying final rule. Further, NMFS held 13 public hearings on the proposed rule and received several hundred written and verbal comments through March 1, 2000. On April 26, 2000, NMFS published an additional notice to request comments on the expanded Initial Regulatory Flexibility Analysis (IRFA) summary, on an additional closed area alternative (DeSoto Canyon) in the eastern Gulf of Mexico, and on the applicability of delayed implementation strategies for time/area closures for the pelagic longline fishery. The comment period on the additional notice closed on May 12, 2000, with approximately 200 written comments and 2000 form letters received on the additional notice alone. Summaries of the comments submitted and NMFS' response can be found in Appendix B and will also be included in the preamble to the final rule.

1.6 Background Research and Supplemental Analyses

The original Swordfish FMP, approved on August 22, 1985, included measures to reduce the number of small swordfish (defined as swordfish under 50 pounds dressed weight (dw)) taken along the Atlantic coast. The primary regulatory mechanism in the plan to reduce the catch of these fish was the Variable Season Closure (VSC). In essence this was a time/area closure in which each fishing area (New England/Mid-Atlantic, South Atlantic, East Florida Coast, Gulf of Mexico, and Caribbean) was to be closed a sufficient amount of time to reduce its catch of small fish. Each area's reduction was determined by first calculating the difference between the total number of fish under 50 pounds dw in the most recent year and the number caught in 1980 and dividing by the number caught in the most recent year (for all areas combined). This fraction was multiplied by each area's catch of small fish in the most recent year resulting in the number of small fish by which that area had to reduce its catch. For each area, monthly landings of small fish were determined for the most recent year and divided by the number of days in the month. The number of closure days necessary to achieve the requisite reduction was then determined.

Closures were to be during September, October, November or December. Each Council then was to select the starting date for closure, but the duration of the closure was set by the requisite reduction and the monthly landings pattern for the previous year. Although the VSC provision was approved by the Secretary of Commerce (Secretary), it was not implemented.

In 1997, NMFS examined billfish catch information from pelagic longline gear during 1986-1996. Catches were plotted, by quarter, year, and species, with copies of these plots provided to the HMS and Billfish APs. Results of these qualitative plots of catch frequency indicated that billfish are encountered throughout the range of the pelagic longline fisheries, with areas of high billfish catch generally reflecting areas of high pelagic longline effort (P. Mace, pers. comm.). However, some notable differences in the distribution of the various billfish species were identified relative to the range of fishing effort (NMFS, unpublished), including, for example, a relatively higher occurrence of blue and white marlin discards in the western Gulf of Mexico, relative to the level of pelagic longline fishing effort.

Goodyear (1998) examined pelagic logbook data from U.S. commercial fishermen to determine the distribution of relative monthly catch rates of billfish and target species by one, two and five degree areas to identify potential time/area strata that could reduce billfish bycatch. The areas examined were limited to the operational areas of the U.S. pelagic longline fleet, which includes a large area outside the U.S. EEZ. Although the results of Goodyear's study demonstrate that time/area closures could be effective in reducing billfish bycatch in commercial fishing gear, his study did not account for redistribution of pelagic longline effort to other open time/area cells. Billfish are sparsely distributed over vast ocean areas; therefore shifting commercial efforts could result in similar, or perhaps even higher billfish encounter rates elsewhere. Another point to consider is the spatial distribution of the closed areas considered in Goodyear's study, which ranged from the Grand Banks, along the east U.S. coast, Gulf of Mexico and Caribbean. Some of the areas identified by Goodyear (1998) are outside the U.S. EEZ where other countries also operate commercial longline fleets. Although ATCA provides authority to close these areas to U.S. pelagic longline vessels, the time/area portion of the final rule focuses on the U.S. EEZ to maximize the effectiveness of the closures, because most effort and catch by U.S.-flagged pelagic longline vessels is within this area.

Cramer and Scott (1998) examined pelagic logbook records for 1987 through 1996 to determine the effect of closures on swordfish and discards from the U.S. pelagic longline fishery. They used two analytical techniques (perfect hindsight analysis and five-year average analysis) to identify spatial patterns in the reduction of bycatch and target catches resulting from quarterly closures of two degree squares (latitude X longitude). The perfect hindsight analysis indicated that 50 percent reduction of reported swordfish discards could be achieved with a loss of approximately 15 percent of target catch. The overwhelming majority of the two degree square closures selected by the five-year average analysis were below 35°N latitude. Cramer and Scott ranked the two degree square areas on a quarterly basis and calculated the expected reduction in discards and target catch. If all effort was removed from those areas, reductions ranged from 15 to 27 percent for swordfish discards, 6 to 14 percent for billfish discards, 7 to 12 percent for swordfish landings, 4 to 6 percent in dolphin landings and 1 to 2 percent in bigeye, albacore,

yellowfin, and skipjack (BAYS) tunas landings. Estimates were also made of the number of landed and discarded fish that would not have been caught if all the effort from the closed areas was distributed among the remaining two degree squares in proportion to the reported effort in those squares. Under this scenario, swordfish discards would decrease by 7 to 23 percent, billfish discards be reduced by 2 to 8 percent, swordfish landings could increase by 0 to 4 percent, and BAYS landing could also increase by 4 to 9 percent.

NMFS published a draft technical memorandum which outlined analyses of various areas for closure to longline fishing (Appendix C of the Draft Supplementary Environmental Impact Statement (DSEIS)). Those analyses were purely biological and focused on areas of high bycatch rates. Refer to Section 7.0 and Appendix C of this document for more information on the analytical procedures used in the time/area analysis.

A recent manuscript from the NMFS Southeast Fisheries Science Center (Scott *et al.*, 2000; Appendix D) provides an analysis of available logbook and observer data sets to evaluate the relationships of U.S. pelagic longline catch rates of billfish in the Gulf of Mexico relative to use of live and dead bait. Blue marlin, white marlin and sailfish discards are combined for this analysis; observer sets with unidentified billfish species, which could include swordfish, are also included in the analysis. Predicted reduction in total billfish bycatch ranges from 2 percent to approximately 30 percent depending upon the source of information (logbook and observer) and assumptions about effort levels following conversion from live to dead bait.

1.7 The Fishery Management Plan and the Framework Process

NMFS published the HMS FMP and Billfish FMP Amendment in April 1999. These documents included rebuilding plans to comply with provisions of the Magnuson-Stevens Act for fisheries identified as overfished, and also contained fishery conservation and management measures to address bycatch and bycatch mortality concerns associated with HMS fisheries. This Final Supplemental Environmental Impact Statement (FSEIS) and the final rule serve as a regulatory amendment to the HMS FMP. Therefore, the final actions apply to those fishermen holding permits for highly migratory species and who use pelagic longline gear. Those pelagic longline fishermen who may target dolphin and wahoo in the South Atlantic Bight but do not hold permits for HMS are required to discard all HMS. The Secretary of Commerce sought the help of the South Atlantic, Gulf of Mexico, and Caribbean Fishery Management Councils (FMC) to develop complementary regulations, as appropriate. The South Atlantic FMC (SAFMC) published a draft FMP (April 2000) for the dolphin and wahoo fishery of the Atlantic, Caribbean and Gulf of Mexico. The draft FMP includes a preferred action to prohibit the use of pelagic longline gear for dolphin and wahoo within "any time or area closure in the SAFMC's area of jurisdiction (Atlantic Coast) which is closed to the use of such gear for highly migratory species." The Gulf of Mexico FMC in its comments on the proposed rule and Draft Supplementary Environmental Impact Statement supported a total closure of the Gulf of Mexico to pelagic longline gear during March through September.

Under the HMS FMP, the activities involved in continuing fishery management include

monitoring, evaluation, adjustment, and revision. There are two primary methods that can be used to change management measures included in an FMP: FMP amendment and framework regulatory adjustment. The HMS FMP included time/area restrictions, gear use restrictions, and gear modifications as management options under the framework procedures. Framework regulatory adjustment procedures provide for timely changes to the management measures in the regulations in response to new information about the fishery. Framework adjustment lends flexibility and efficiency to the regulatory process by allowing NMFS to make time-critical changes in the regulations without engaging in the longer process of amending the FMP. Framework adjustment is not intended to circumvent the FMP amendment process that must take place when circumstances in the fishery change substantially or when a different management philosophy or objectives are adopted, triggering significant changes in the management system. Rather, framework adjustment is intended to make it possible to manage fisheries and meet the objectives of the FMP more responsively under conditions requiring timely management actions. As with an FMP amendment, framework adjustments must go through extensive public and analytical review. This includes a proposed rule, a public comment period, at least one public hearing, and a final rule. AP meetings will be held for a rulemaking if the agency deems it necessary for purposes of consultation or AP review. The AP and public comment processes for this final action on bycatch reduction under the framework process are summarized above in Section 1.4.

1.8 Summary

The purpose of this document is to consider a full range of fishery management alternatives that minimize, to the extent practicable, bycatch, bycatch mortality, and incidental catches of undersized swordfish, billfish, and other non-target HMS, as well as protected species taken by U.S. commercial pelagic longline fishermen operating in the Atlantic Ocean. NMFS considered alternatives that enhance the survival of bycatch and incidental catches of these species that are captured on pelagic longline gear. In this document, NMFS considers the biological, social and economic impacts of these potential management actions. This document supports rulemaking by providing the required analyses of the impacts of the final regulations. This FSEIS serves as a supplement to the environmental impact statement that accompanied the regulations that implemented the HMS FMP. That document can be requested from NMFS, Highly Migratory Species Division, 1315 East-West Highway, Silver Spring, MD 20910, or accessed from the following Internet address: <http://www.nmfs.gov/sfa/hmspg.html>.

SECTION 2 THROUGH SECTION 4 INTENTIONALLY OMMITTED

5.0	DESCRIPTION OF THE AFFECTED ENVIRONMENT	5-1
5.1	Swordfish	5-1
5.2	Atlantic Billfish	5-1
5.3	Atlantic Tunas	5-2
5.4	Large Coastal and Pelagic Sharks	5-2
5.5	Other Finfish	5-3
5.6	Status of the Stocks	5-3
5.7	Marine Mammals	5-4
5.8	Sea Turtles	5-5
5.8.1	Background Information for Biological Opinion for the Atlantic Pelagic Longline Fishery	5-5
5.8.2	Conclusion of Biological Opinion	5-12
5.8.3	Reasonable and Prudent Alternatives	5-12
5.8.4	Incidental Take Statement	5-14
5.8.5	Reasonable and Prudent Measures	5-15
5.9.	Sea Birds	5-16
Table 5.1.	Status of Highly Migratory Species Stocks in the Atlantic Ocean.	5-3
Table 5.2.	Status of Atlantic sea turtle populations: Species taken in the pelagic longline fishery 1992-1997.	5-5
Table 5.3.	Summary of incidental take levels anticipated under the incidental take statements associated with NMFS existing BOs in the US Atlantic and Gulf of Mexico. .	5-6
Table 5.4.	Estimated Sea Turtle Takes Recorded in the U.S. Atlantic and Gulf of Mexico Pelagic Longline Fishery for Swordfish, Tuna and Sharks, 1992 - 1998.	5-7
Table 5.5.	Comparison of the estimates of total bycatch by species and year among the pooling treatment of zero observer effort strata using two different pooling orders.	5-8
Table 5.6.	Observed Levels of Loggerhead and Leatherback Sea Turtles Taken Incidental to Commercial Pelagic Longlining for Swordfish and Tuna in the U.S. Atlantic Fleet in 1999.	5-10

5.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

Pelagic longline fishermen encounter many species of fish; some of those captured are marketable and thus are retained, others are discarded for economic or regulatory reasons. Species frequently encountered are swordfish, tunas, and sharks, as well as billfish, dolphin, wahoo, king mackerel, and other finfish species. Sometimes pelagic longline fishermen also hook sea turtles, marine mammals, and sea birds, known collectively as “protected” species. All of these species are federally managed, and NMFS seeks to control the mortality that results from fishing effort. Detailed descriptions of the life histories and population status of those species are given in the HMS FMP and are not provided here. Management of declining fish populations requires reductions in fishing mortality from both directed and incidental fishing. The status of the stocks of concern is summarized below.

5.1 Swordfish

Atlantic swordfish (*Xiphias gladius*), also known as broadbill, are large migratory predators that range from Canada to Argentina in the West Atlantic Ocean. Swordfish live to be more than 25 years old, and reach a maximum size of about 902 lb dw. Females mature between ages 2 and 8 with 50 percent mature at age 5 at a weight of about 113 lb dw. Males mature between ages 2 and 6 with 50 percent mature at age 3 at a weight of about 53 lb dw (Arocha, 1997). Large swordfish are usually females; males seldom exceed 150 lb dw. Swordfish are distributed globally in tropical and subtropical marine waters. Their broad distribution, large spawning area, and prolific nature have contributed to the resilience of the species in spite of the heavy fishing pressure being exerted on it by many nations. During their annual migration, North Atlantic swordfish follow the major currents which circle the North Atlantic Ocean (including the Gulf Stream, Canary and North Equatorial Currents) and the currents of the Caribbean Sea and Gulf of Mexico. The primary habitat in the western North Atlantic is the Gulf Stream, which flows northeasterly along the U.S. coast, then turns eastward across the Grand Banks. In U.S. waters, young swordfish predominate year-round in pelagic longline catches off Florida's "panhandle" (Apalachicola Bay) and off the south and east coasts of Florida.

In 1999, scientists of the International Commission for the Conservation of Atlantic Tunas (ICCAT) conducted a stock assessment on North Atlantic swordfish. The biomass of the North Atlantic stock is estimated to be 65 percent of the level needed to produce maximum sustainable yield (SCRS, 1999). It appears as though quota decreases and possibly minimum size restrictions, may have protected undersized swordfish over the last three years. In 1999, ICCAT nations agreed to a ten-year rebuilding program. Quotas must be strictly monitored, as overages can result in penalties, including quota reductions and trade sanctions, under ICCAT's compliance recommendations.

5.2 Atlantic Billfish

Blue marlin (*Makaira nigricans*), white marlin (*Tetrapturus albidus*) and sailfish (*Istiophorus platypterus*) are highly migratory billfish that are widely distributed over the Atlantic Ocean

(including the Caribbean Sea and Gulf of Mexico). They are opportunistic feeders, feeding primarily on fish and squid. Marlins, in addition to sailfish and longbill spearfish, are bycatch in the Atlantic pelagic longline fishery. Billfish FMP Amendment provides more detailed background regarding the life history strategies of Atlantic billfish, including, age and growth, reproduction, movement pattern, influences of physical oceanographic features, essential fish habitat and other information.

Results of the most recent stock assessment for Atlantic blue marlin and Atlantic white marlin (SCRS, 1996) indicate that Atlantic-wide biomass levels have been below the level necessary to produce maximum sustainable yield (B_{MSY}) for about three decades under both total Atlantic and north Atlantic stock hypotheses (SCRS, 1998). The Atlantic Billfish FMP amendment includes a 10-year rebuilding plan for blue and white marlin as a foundation for the negotiations at the 2000 ICCAT meetings.

5.3 Atlantic Tunas

Tunas are highly migratory fish found in many of the world's tropical, subtropical, and temperate ocean regions. Bluefin (*Thunnus thynnus*), bigeye (*Thunnus obesus*), and albacore (*Thunnus alalunga*) tunas are widely distributed throughout the Atlantic, while yellowfin tuna are considered to be a subtropical species. Bluefin tuna mature at approximately age 8 or later (60 inches CFL), while yellowfin, bigeye, and albacore tunas mature at a smaller size (40 inches CFL). Smaller yellowfin tuna form mixed schools with skipjack tuna and juvenile bigeye tuna and are mainly limited to surface waters, while larger yellowfin tuna are found in surface and sub-surface waters. Bigeye tuna inhabit waters deeper than those of any other tuna species and undertake extensive vertical movements. Albacore tuna tend to inhabit deeper waters, except when young. Many of these tunas are opportunistic feeders, eating mainly fish and squid (SCRS, 1999b). Commercial and recreational fishermen from numerous countries participate in fisheries for several species of Atlantic tuna.

5.4 Large Coastal and Pelagic Sharks

Large coastal sharks (LCS) are comprised of several species. Many of these species make extensive migrations along the U.S. Atlantic coast. Several LCS are caught by pelagic longline gear, including silky, dusky, sandbar, and hammerhead sharks. Pelagic sharks commonly taken in the pelagic longline fishery include shortfin mako, porbeagle, common thresher, and blue; longfin mako, sixgill, bigeye sixgill, and sevengill are occasionally or rarely taken. Trans-Atlantic migrations of these pelagic sharks are common; they are taken in several international fisheries outside the U.S. EEZ.

Compared to other finfish, sharks have low reproductive rates which make them especially vulnerable to overfishing. Because LCS are overfished and the status of pelagic sharks is unknown at this time (but in 1993 were found to be fully fished), NMFS seeks to minimize interactions between these species and pelagic longline gear.

5.5 Other Finfish

Dolphin (*Coryphaena hippurus*) are fast-swimming, pelagic, migratory, and predatory fish found in tropical and subtropical waters throughout the world. They are short-lived and fast growing, traits that allow the stock to support high fishing mortality rates. Also referred to as mahi-mahi, these fish are sold by commercial fishermen (driftnet and pelagic longline) and are targeted by recreational fishermen along the U.S. southeastern Atlantic and Gulf of Mexico coasts. Dolphin was one of the top ten recreationally harvested species in 1998 (NMFS, 1999a).

Wahoo (*Acanthocybium solanderia*) are large pelagic fish found throughout the tropical and subtropical waters of the Atlantic Ocean. The life history of wahoo is largely unknown, although they are a fast-growing species similar to dolphin. These fish are also landed both recreationally and commercially, although encounter rates are generally lower than those for dolphin.

5.6 Status of the Stocks

A summary of the status of the major highly migratory species stocks caught on pelagic longlines is provided in Table 5.1. SCRS conducted a stock assessment for North and South Atlantic swordfish in 1999 based on international catch and catch per unit effort data through 1998. Tuna and billfish assessments took place in 1997, using data through 1996. These SCRS assessments are based on international catch and effort data that are submitted to ICCAT. Shark status is evaluated through a group of scientists convened by NMFS using U.S. catch and effort data only (in 1998, estimates of Mexican landings of blacktip sharks were provided). The group of pelagic sharks is comprised of less than 10 species and currently the status of this group is unknown. In 1993, this species group was identified as fully fished. Available information on catch, landings, and catch rates is insufficient to accurately determine the status of this species grouping, although there is concern particularly regarding porbeagle sharks, and the level of blue shark discards from pelagic longline fisheries. NMFS has listed north Atlantic swordfish, bluefin tuna, bigeye tuna, northern albacore, blue and white marlin, sailfish, and large coastal sharks as overfished, because the fishing mortality rate is higher than that required to keep a population at maximum sustainable yield (MSY) or because biomass is below the level that would support MSY (or both). Further details about stock status, minimum biomass thresholds, and maximum fishing mortality levels can be found in the HMS FMP and the Billfish FMP amendment.

Table 5.1. Status of Highly Migratory Species Stocks in the Atlantic Ocean. Source: SCRS,1999; NMFS 1999b, c.

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Fishing Mortality Rate (Threshold is F_{MSY})	Outlook
N. Atlantic Swordfish	$B_{1999}/B_{MSY} = 0.65$ (0.5 to 1.05)	$0.8B_{MSY}$	$F_{1998}/F_{MSY} = 1.34$ (0.84 to 2.05)	Overfished; rebuilding plan in place
S. Atlantic Swordfish	$B_{1999}/B_{MSY} = 0.1.10$ (0.84to 1.40)	$0.8B_{MSY}$	$F_{1998}/F_{MSY} = 1.34$ (0.81 to 2.54)	Overfishing may be occurring

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Fishing Mortality Rate (Threshold is F_{MSY})	Outlook
W. Atlantic Bluefin Tuna	SSB_{1997}/SSB_{MSY} (two line)=0.48 SSB_{1997}/SSB_{MSY} (Beverton-Holt)=0.071 $SSB_{1997}/SSB_{75}=0.14-0.17$	$0.86B_{MSY}$	F_{1997}/F_{MSY} (two-line) = 1.73 F_{1997}/F_{MSY} (Beverton-Holt) = 4.10	Overfished; rebuilding plan in place
Atlantic Bigeye Tuna	$SSB_{1998}/B_{MSY}=0.57$ to 0.63	$0.6B_{MSY}$ (age 2+)	$F_{1998}/F_{MSY}=1.5$ to 1.82	Borderline overfished; Overfishing is occurring
Atlantic Yellowfin Tuna	$B_{1997}/B_{MSY}=0.92$ to 1.35	$0.5B_{MSY}$ (age 2+)	$F_{1997}/F_{MSY}=$ variable > 1.0	Stock not overfished; Fishing mortality is probably greater than what would produce MSY
N. Atlantic Albacore Tuna	$B_{1997}/B_{MSY}=0.47$ (0.34 to 0.63) $B_{90-94}/B_{75-80}=0.72$	$0.7B_{MSY}$	$F_{1997}/F_{MSY}=1.39$ (uncertain) $F_{1997}/F_{MAX}=0.91$ $F_{1997}/F_{0.1}=1.60$	Overfished; Overfishing is occurring; SCRS notes stock stock is at or above full exploitation
W. Atlantic Skipjack Tuna	unknown	unknown	unknown	unknown
Atlantic Blue Marlin	$B_{1996}/B_{MSY}=0.236$	$0.9B_{MSY}$	$F_{1995}/F_{MSY}=2.87$ (1.45 to 3.41)	Overfished; overfishing is occurring
Atlantic White Marlin	$B_{1996}/B_{MSY}=0.226$	$0.85B_{MSY}$	$F_{1995}/F_{MSY}=1.96$ (1.33 to 2.91)	Overfished; overfishing is occurring
West Atlantic Sailfish	$B_{1992-96}/B_{MSY}=0.62$	$0.75B_{MSY}$	$F_{91-95}/F_{MSY}=1.4$	Overfished; overfishing is occurring
Large Coastal Sharks (all species)	$N_{1998}/N_{MSY}=0.30$ (baseline) $N_{1998}/N_{MSY}=0.36$ (alternative)	$0.9B_{MSY}$	$F_{1997}/F_{MSY}=6.34$ (baseline) $F_{1997}/F_{MSY}=6.03$ (alternative)	Overfished; overfishing is occurring
Small Coastal Sharks	$B_{1991}/B_{MSY}=1.12$	$0.9B_{MSY}$	$F_{86-91}/F_{MSY}=0.89$	Fully fished; Overfishing is not occurring
Pelagic Sharks	unknown	unknown	unknown	unknown

5.7 Marine Mammals

Pelagic longline fishermen have been observed over the period from 1993 through 1997 to encounter short and long-finned pilot whales, spotted and bottlenose dolphins, Risso's dolphin, a Clymene dolphin, and a killer whale. The most recent annual estimate indicates that the U.S. Atlantic pelagic longline fleet caught 39 marine mammals in 1997; all were released alive. Most of the marine mammals were encountered in the U.S. EEZ between South Carolina and Cape Cod.

NMFS is most concerned about the impact of pelagic longline fishing on the pilot whales that prey on longline-hooked tunas. Two species of pilot whales (*Globicephala melas* and *G.*

macrorhynchus) are distributed principally along the continental shelf edge in the winter and spring off the northeast U.S. coast. In late spring, pilot whales move onto Georges Bank and into the Gulf of Maine and more northern waters. They remain there through the autumn. In general, pilot whales tend to occupy habitats with complex bottom structure. The stock structure of the North Atlantic population is currently unknown, however several genetic studies are underway. Sightings of these animals in U.S. waters occur primarily within the Gulf Stream, and primarily along the continental shelf and slope in the northern Gulf of Mexico.

5.8 Sea Turtles

Loggerhead and leatherback turtles are the species predominantly caught in the Atlantic pelagic longline fishery. Turtles are caught throughout the range of the fishery (Gulf of Mexico, Caribbean, Florida to Maine) but the sets with the most turtles occur in the Northeast Distant area (see Figure 6.2). Many sea turtle populations are especially slow to recover from increased fishing mortality because their reproductive potential is low (late sexual maturation, low juvenile survival). General information about the biology and status of sea turtles can be found in the Recovery Plans for each species (available through the Office of Protected Resources, NMFS); the status of sea turtle populations is provided in Table 5.2. Most turtles are released alive from pelagic longline entanglements. However, NMFS is concerned about serious injury and mortality of turtles once they are released.

Table 5.2. Status of Atlantic sea turtle populations: Species taken in the pelagic longline fishery 1992-1997. Source: NMFS, 1999d.

Species/Stock	Status: trend in U.S. nesting population
Loggerhead: Northern Sub-population	Threatened: declining through mid-1980s, no trend detected since that time
Leatherback	Endangered: loss of some nesting populations, otherwise stable
Green	Endangered: increasing
Kemp's Ridley	Endangered: thought to be increasing
Hawksbill	Endangered: unknown if there is a recent trend

5.8.1 Background Information for Biological Opinion for the Atlantic Pelagic Longline Fishery

The Office of Sustainable Fisheries (OSF) requested a re-initiation of consultation under section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*), on November 19, 1999, based on preliminary reports that observed incidental take of loggerhead sea turtles by the Atlantic pelagic longline fishery during 1999 had exceeded levels anticipated in the April 23, 1999, Biological Opinion (BO) for the pelagic longline component of HMS fisheries. Specifically, the Incidental Take Statement (ITS) of the April 23, 1999, BO allowed the following levels of incidental take:

- (a) 690 leatherback sea turtles (*Dermochelys coriacea*), entangled or hooked (annual estimated number) of which no more than 11 are observed hooked by ingestion or moribund when released.
- (b) 1541 loggerhead sea turtles (*Caretta caretta*) entangled or hooked (annual estimated number); of which no more than 23 may be hooked by ingestion or observed moribund when released.

A draft BO was provided to OSF in early June 2000; a final BO is scheduled to be completed by late June 2000. It is not anticipated that the final BO will differ significantly from the draft BO in regard to the Reasonable and Prudent Alternatives (RPAs), Reasonable and Prudent Measures (RPMs), and Terms and Conditions (TCs) of the draft BO. The draft BO also addressed the shark drift gillnet fishery and HMS purse seine fisheries; however, the following discussion addresses only issues in the BO that apply specifically to the pelagic longline fishery.

In recent years, NMFS has undertaken several ESA section 7 consultations to address the effects of vessel operations and gear associated with Federally-permitted fisheries on threatened and endangered species in the action area. Each of those consultations sought to develop ways of reducing the probability of adverse effects of the action on large whales and sea turtles. Similarly, NMFS has undertaken recovery actions under both MMPA and ESA to address the problem of take of whales in the fishing and shipping industries. Incidental take levels anticipated under the ITs associated with these existing BOs, not including those for the pelagic longline fishery, are summarized in Table 5.3 below, followed by a brief discussion of each action on which there is consultation.

Table 5.3. Summary of incidental take levels anticipated under the incidental take statements associated with NMFS existing BOs in the US Atlantic and Gulf of Mexico. Note: This table does not include the anticipated takes for the Atlantic pelagic longline fishery. Source: NMFS, 2000b.

Federal Action	Anticipated Incidental Take Level (lethal or non)				
	Loggerhead	Leatherback	Green	Kemp's	Hawksbill
Coast Guard Vessel Operation	1 ¹	1 ¹	1 ¹	1 ¹	1 ¹
Navy – SE Ops Area	84	12	12 ¹	12 ¹	0
Shipslock – Seawolf	50	6	4 ¹	4 ¹	4 ¹
COE Dredging – S. Atlantic	35	0	7	7	2
COE Dredging - N & W Gulf of Mexico	30	0	8	14	2
COE Dredging - E Gulf of Mexico	2 + 8 ²	0 + 5 ²	1 + 5 ²	1 + 5 ²	1 + 5 ²
COE Rig Removal, Gulf of Mexico	1 ¹	1 ¹	1 ¹	1 ¹	1 ¹
MMS Rig Removal, Gulf of Mexico	10 ³	5 ³	5 ³	5 ³	5 ³
NE Multispecies Sink Gillnet Fishery	100 ⁴	10 ⁴	10 ⁴	10 ⁴	10 ⁴
ASMFC Lobster Plan	0 ⁵	0 ⁵	0 ⁵	0 ⁵	0 ⁵
Monkfish Fishery	6	1	1	1	0
Dogfish Fishery	6	1	1	1	0
Summer Flounder, Scup & Black Sea Bass	15	3 ¹	3 ¹	3 ¹	3 ¹

Federal Action	Anticipated Incidental Take Level (lethal or non)				
	Loggerhead	Leatherback	Green	Kemp's	Hawksbill
Shrimp Fishery	3550 ¹	650	3550 ¹	3550 ¹	3550 ¹
NRC – St. Lucie, FL	5	1	10	1	1
NRC – Brunswick, NC	50 ¹ (6)	50 ¹ (0)	50 ¹ (3)	50 ¹ (2)	50 ¹ (0)
NRC – Crystal River, FL	55 ¹ (1)	55 ¹ (1)	55 ¹ (1)	55 ¹ (1)	55 ¹ (1)
Total (maximum anticipated⁶)	4008	801	3724	3721	3690

¹Up to this amount for these species, in combination. In most cases, it is expected that takes of turtle species other than loggerheads will be minimal. Parentheses indicate expected mortalities, where provided in the BO. Other numbers represent “takes”, including non-lethal captures.

²Up to 8 turtles total, of which, no more than 5 may be leatherbacks, greens, Kemp's or hawksbill, in combination.

³Not to exceed 25 turtles, in total.

⁴As part of the 1989 BO on the Issuance of Exemptions for Commercial Fishing Operations under MMPA Section 114.

⁵Included in totals noted above.

⁶Maximum values given for non-loggerhead hardshell turtles are extreme, due to lumping of anticipated takes across species under ITS s.

Sea turtle bycatch estimates based on observations of takes in the pelagic longline component of the swordfish/tuna/shark fishery number in the thousands. The incidental take estimates anticipated in Scott and Brown (1997), used in the April 23, 1999, BO, were revised and updated by estimates provided in Johnson *et al.* (1999) and Yeung (1999). The estimated numbers for all species of sea turtles caught on pelagic longline gear are provided in Table 5.4. below. These estimates are similar to those used in developing the April 23, 1999, BO, and are provided as background in understanding the magnitude of take occurring in the fishery. However, subsequent to the analyses noted above, the Southeast Fisheries Science Center (SEFSC) developed an improved method (Brown *et al.*, 2000) for estimating swordfish catch which pooled across quarters, years and areas rather than the previously used method (also followed for protected species bycatch estimation) that assumed zero catch in areas not sampled. The SEFSC then followed with revised estimates of protected species bycatch (Yeung and Epperly, in prep.) following the Brown *et al.* (2000) method but with pooling priorities selected as appropriate for these species. Although peer review and refinement of the manuscript is not yet complete, NMFS believes this methodology is more accurate and appropriate than that used in previous analyses of these data, as the failure to account effort in unobserved areas would result in negative bias in the estimates. The Yeung and Epperly (in prep.) data, although preliminary, are reported below (see Table 5.5).

Table 5.4. Estimated Sea Turtle Takes Recorded in the U.S. Atlantic and Gulf of Mexico Pelagic Longline Fishery for Swordfish, Tuna and Sharks, 1992 - 1998. Source: Johnson *et al.*, 1999, Yeung, 1999b, NMFS, 2000b.

Species	Loggerhead		Leatherback		Green		Hawksbill		Kemp's		Sum Total**
	Total	Dead*	Total	Dead*	Total	Dead*	Total	Dead*	Total	Dead*	
1992	247	18	871	87	129	18	30	0	0	0	1295
1993	374	9	889	12	25	0	0	0	0	0	1315

1994	1279	12	700	12	24	0	0	0	15	0	2047
1995	2169	0	925	0	31	0	0	0	0	0	3290
1996	410	0	674	0	0	0	0	0	0	0	1084
1997	329	0	357	0	0	0	13	0	23	0	765
1998	472	0	169	0	0	0	77	0	0	0	718

* Does not account for death that may occur after release, which several studies have shown to be 29-33 percent

**Totals include unidentified turtles not listed in the table.

The previous estimated take for all species combined (pooled within areas) was 728 (337-1824, 95 percent CI) in 1998, with a high of 3,136 (2,325-4,260, 95 percent CI) in 1995. Of these, the estimated number in the bycatch that were released dead ranged from 0 in 1995-1997 to 60 (11-307, 95 percent CI) in 1992 (note: this does not account for death that may occur after the release). These totals include unidentified turtles not listed in the table. Most marine turtles were caught from the Grand Banks (NED) fishing area, outside of the US EEZ. These estimates include the loggerhead, leatherback, Kemp's ridley, hawksbill and green sea turtles (see Appendix III). However, the records of the Kemp's ridley and green captures may have been misidentifications and should be re-evaluated (see Hoey, 1998; Witzell 1999).

For 1998, Yeung (1999) provided estimates for the number of sea turtles “seriously injured” (*i.e.*, those not expected to survive). Pooling across species but stratified by area, an estimated total of 730 sea turtles were taken. Of these, Yeung (1999) estimates that all but 10 were seriously injured. This is a much greater predicted mortality rate than that reported by Aguilar *et al.* (1992). Yeung’s (1999) criteria for determining serious injury were based on criteria developed for marine mammals (Angliss and DeMaster, 1998) and may be overly conservative for sea turtles. These values still use the “old” methods of estimation (*i.e.*, data were not pooled across quarters, years or areas).

Table 5.5. Comparison of the estimates of total bycatch by species and year among the pooling treatment of zero observer effort strata using two different pooling orders. Note: qyn and yqn stand for q=quarter, y=year, n= NAREA (the order from left to right represents the pooling priority) and two different minimums for observed sets: 5 and 30 (qyn5 is used in the Yeung and Epperly (in prep.) as it requires less pooling from more distantly related samples). Estimates using the omission treatment (omit, *i.e.*, estimate assigns zero values to areas not sampled) used in Johnson *et al.* (1999) Table 10 and in Yeung (1999) Table 5 are also listed. Source: NMFS, 2000b.

Species	Year	qyn5	qyn30	yqn5	yqn30	Omit
Unid. turtle	92	30	30	37	34	
	93	27	30	27	27	28
	94	33	20	33	21	19
	95	135	79	135	80	
	96	7	25	7	26	
	97	41	58	41	62	19
	98	4	23	2	30	
	Total	277	265	282	280	66

Species	Year	qyn5	qyn30	yqn5	yqn30	Omit
Green	92	90	67	78	56	37
	93	29	38	29	48	32
	94	29	36	27	51	25
	95	35	8	34	23	
	96	19	27	27	35	
	97	4	10	1	5	
	98	14	23	12	18	
	Total	220	209	208	236	94
Hawksbill	92	26	23	20	20	15
	93					
	94				3	
	95		2		1	
	96	3	8	1	3	
	97	13	4	13	5	13
	98	13	4	13	7	13
	Total	55	41	47	39	41
Kemp's ridley	92	1	4	1	4	
	93					
	94	23	24	23	24	19
	95		3			
	96	3	6	1	6	
	97	18	20	18	18	17
	98	1	3		2	
	Total	46	60	43	54	36
Leatherback	92	941	811	764	925	350
	93	992	945	993	880	876
	94	763	755	774	693	477
	95	874	953	877	959	880
	96	726	747	782	815	36
	97	313	405	319	453	51
	98	394	532	435	609	181
	Total	5003	5148	4944	5334	2851
Loggerhead	92	215	790	188	932	88
	93	392	635	389	483	388
	94	1299	1460	1274	1296	346
	95	2233	2124	2231	2005	1418
	96	957	933	986	965	118
	97	461	534	417	500	201
	98	987	902	1018	954	516
	Total	6544	7378	6503	7135	3075

Preliminary information from observer data for 1999 indicates that 45 leatherbacks, 64 loggerheads and 3 unidentified turtles were observed taken; 1 of the loggerheads was dead when boated (NMFS, unpublished data). The location of the hook was not always recorded (N=60) and thus it is assumed that all animals for which this information was not recorded were seriously injured. Thus, 19 of 45 (42 percent) leatherbacks, 50 of 64 (78 percent) loggerheads and 1 of 3 (33 percent) unidentified turtles were assumed to have ingested the hook and were seriously injured or dead. In addition, many animals were released with line still attached, which may also contribute to subsequent mortality.

Observed take levels documented in 1999 indicate that, of all the turtles taken, up to 50 loggerheads and 19 leatherbacks were observed "hooked by ingestion" or moribund upon release (Table 5.6). However, only about 3 percent observer coverage was obtained (G. Scott, pers.

comm.). The anticipated take levels were based on 5 percent observer coverage. Thus, the observed levels of take would have been considerably higher had the required 5 percent coverage level been achieved (as represented by the higher numbers). If the 5 percent observer coverage had been achieved, NMFS preliminarily expects that up to 83 loggerheads and 32 leatherbacks would have been observed “hooked by ingestion” or moribund in 1999.

Table 5.6. Observed Levels of Loggerhead and Leatherback Sea Turtles Taken Incidental to Commercial Pelagic Longlining for Swordfish and Tuna in the U.S. Atlantic Fleet in 1999.
Source: NMFS, 2000b.

Species	Total Observed Takes	Anticipated Take by Hook or Ingestion	Actual no. Observed Dead or Taken by Hook or Ingestion ¹	No. taken if Scaled ² to 5% Effort Level	Estimated ³ no. Taken by Hook or Ingestion, Extrapolated ³ to 5% Coverage Level	Amount ITS Exceeded Actual and (Estimated)
Loggerhead	64	23	50	83	32	60 (9)
Leatherback	45	11	19	32	22	13 (11)

¹Observer logs in most cases were not detailed enough to determine whether or not a mouth hooked animal was “hooked by ingestion”; thus to be conservative, cases which were unclear were considered as “hooked by ingestion.”

²Number observed * 5 percent level desired / 3 percent achieved.

³Based on 29 percent of Total Observed Takes (per post-release mortality estimates provided by Aguilar *et al.*, 1992)

While a determination of whether an animal meets the criteria of “hooked by ingestion or moribund when released” is in some cases somewhat subjective due to the limited detail regarding entanglements provided on observer forms, in most cases the animal’s status is very clear (e.g. comments indicating “hooked in gullet”) or would be clear if a higher level of detail is provided by the observer. Additionally, where enough detail is not provided, NMFS takes the risk averse approach and assumes the injury may be serious enough to eventually incur death.

For the loggerhead turtle and for all sea turtle species, juvenile survivorship to maturity and adult longevity are critical to population growth. For the loggerhead turtle with an especially long pelagic stage, a reduction in mortality over the 7-12 years of the pelagic stage, during which it is vulnerable to incidental take by this fishery, is especially critical (Heppell *et al.*, in prep).

Witzell (1999) summarized turtle catch from logbook data (1992 - 1995) for sets targeting swordfish and tuna, or both. The Northeast Distant Area accounted for 70 percent of the loggerhead and 47 percent of the leatherback captures that were reported north of the mid-Atlantic Bight. June through November were the peak months for reported captures. A review of observer reports for sets targeting all species between 1990 - 1996 yielded similar results (Hoey, 1998). The Northeast Distant accounted for 75 percent of the loggerhead and 40 percent of the leatherback captures for all sampling areas. The Northeast Distant Area also was the only area where interactions of four or more turtles occurred on a single set. July through November were the predominant months for turtle captures (Hoey, 1998).

It has been suggested that the use of lightsticks is associated with the incidental take of sea turtles in pelagic longline fisheries (Witzell and Cramer, 1995; Price, 1995). Examination of logbook data indicated that CPUE for leatherbacks and loggerheads doubled with the use of lightsticks

(Witzell and Cramer, 1995). However, Hoey's 1998 analysis of Atlantic pelagic longline observer data from 1990 - 1996 indicated that lightstick use had little bearing on levels of sea turtle bycatch. For the Hawaii longline fishery, Skillman and Kleiber (1998) were unable to predict turtle capture based on lightstick use. The use of lightsticks was associated with a number of other more significant predictor variables (e.g. latitude and fishing for swordfish) (Skillman and Kleiber, 1998). Preliminary results of a study on the response of post-hatchling loggerheads to lightsticks indicate that the turtles were strongly attracted to glowing green lightsticks and were weakly attracted to glowing yellow Coghlan lightsticks; methodology developed for testing these animals needs to be applied to older animals (Wang *et al.*, 2000).

NMFS held a workshop in Miami on August 31- September 1, 1999, to discuss monitoring the number of turtles taken and killed in the pelagic longline fisheries and to discuss steps that could be taken to reduce the takes. The report (Kleiber *et al.*, in prep.) lists recommendations for data collection. The Atlantic recommendations were: 1) the color of the lightsticks should be recorded; 2) the position of takes in relation to floats and lightsticks must be recorded; and 3) an estimate of the length of line remaining on the turtle when released should be made. To date only the third recommendation has been implemented in the Atlantic pelagic longline fishery. The report further recommends prioritized avenues of research to both reduce turtle takes in the longline fisheries and improve the survival of turtles taken. Recommendations to reduce takes included targeted closures to selectively achieve a reduction in effort where takes were particularly high, setting hooks deeper in the water column, restrictions on time of day that the lines soaked and were fished, experiments/analyses to determine takes relative to floats or lightsticks and to determine vulnerability relative to time of day, some hook testing, and research on turtle deterrents (e.g., dyed bait). Recommendations to improve survival included changes in the hooks used (circle vs. J and highly corrodible), increase in gangion line length, removal of all line from turtle before release, shortened soak times, and improved handling guidelines.

There are few sources of information on the level of mortality caused by pelagic longlines. In the Spanish pelagic longline fishery, the minimum mortality due to ingestion/internal hooking (84 percent of the loggerheads captured had ingested the hook) was estimated to be 29 percent (Aguilar *et al.*, 1992) in addition to the mortality associated with drowning while hooked (4 of 1098 animals). Post-hooking mortality studies in both the Atlantic and Pacific, based on satellite-tag transmissions of deeply (ingested) and lightly (mouth or foul hooked) hooked turtles of all species (mostly loggerheads), indicate that 29 percent (11 of 38) died (Balazs, pers. comm.; Polovina *et al.*, in press; Bjørndal *et al.*, 1999); 11 of 25 (44 percent) deeply hooked animals failed to transmit signals from their satellite transmitters after being released; the assumption is that they died and remained submerged. The deeply hooked animals tracked by Balaz had all lines removed and were dehooked where possible prior to released; thus 44 percent is likely an underestimate of mortality for deeply hooked animals. The transmissions of the remaining 14 were no different from the transmissions of 13 lightly hooked (in mouth, beak, or flipper) and thus it is assumed that all lived. Sea turtle mortality reported due to drowning in the Mexican tuna longline fishery in the Gulf of Mexico was 33 percent (Ulloa Ramirez and Gonzáles Ania, in press) and there is no estimate of post-hooking mortality in that fishery. Therefore, based on the total estimated catch and a 29 percent mortality rate, 593 and 954 turtles may have died in 1994

and 1995, respectively in the pelagic longline fishery. This is likely a low estimate.

The numbers under the “actual number observed dead or hooked by ingestion” column in Table 5.6 above, minus the one mortality (*i.e.* the deeply hooked animals) represent 62.5 percent of the total observed takes. Multiplying this by the 44 percent mortality estimate observed by Balaz (pers. comm.) for deeply hooked animals yields an overall estimate of 27.5 percent mortality for this fishery, thus reinforcing the 29 percent figure reported by Aguilar *et al.* (1992) as a solid, conservative estimate of minimum mortality.

Requiring fishermen to move after an interaction with not only a marine mammal, as recommended by the AOCTRT, but following an interaction with a sea turtle as well (as now required in the HMS FMP), is intended to mitigate against the contagious distribution of marine mammal and sea turtle takes noted in the observer data set. If fishermen comply with this provision, according to industry representatives familiar with the observer data set, there could be up to a 40 percent reduction in levels of serious injury and mortality of strategic stocks of marine mammals. Hoey (1998) noted that for the Northeast Distant fishing area, 68.1 percent of all loggerheads observed entangled in pelagic longline gear were caught on sets with other loggerheads. For leatherbacks, 31.7 percent were caught on sets with other leatherbacks. Thus, HMS’ adoption of this measure in the April 1999 HMS FMP could substantially decrease incidental take levels of both marine mammals and sea turtles. However, as OSF notes in the HMS FMP, this measure is extremely difficult, if not impossible to enforce. Given this difficulty, NMFS is hopeful that, provided with education, fishermen will comply. NMFS also hopes that with the continued promotion of protected species conservation affected via the educational outreach/workshop efforts discussed below, an increased level of compliance with this requirement may be achieved. However, without having an observer onboard there is no way to fully ascertain that fishermen will comply with this provision.

5.8.2 Conclusion of Biological Opinion

After reviewing the current status of the northern right whale, the humpback, fin and sperm whales, and leatherback, loggerhead, green, hawksbill, and Kemp’s ridley sea turtles, the environmental baseline for the action area, the effects of implementation of the proposed Amendment to the Atlantic HMS FMP, the record of compliance with requirements of previous BOs on HMS fisheries, and probable cumulative effects, it is NMFS’ BO that continued operation of the Atlantic pelagic longline fishery is likely to jeopardize the continued existence of loggerhead sea turtles. It is possible, pending additional analysis, that the final BO will also include a jeopardy finding for the pelagic longline fishery for leatherback sea turtles. If this happens, NMFS expects that similar RPAs would be required.

5.8.3 Reasonable and Prudent Alternatives (RPAs)

Regulations (50 CFR §402.02) implementing section 7 of the ESA define RPAs as alternative actions, identified during formal consultation, that: 1) can be implemented in a manner consistent with the intended purpose of the action; 2) can be implemented consistent with the scope of the

action agency's legal authority and jurisdiction; 3) are economically and technologically feasible; and 4) would, NMFS believes, avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

The draft BO concluded that the Atlantic pelagic longline fisheries for swordfish, tunas, and sharks are likely to jeopardize the continued existence of loggerhead sea turtles. The clause "jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (CFR §402.02).

Federal fisheries threaten loggerhead sea turtles primarily by capturing them in differing types of gear, injuring turtles caught in fishing gear, harming turtles that manage to escape by leaving gear trailing from their mouths or body parts, drowning turtles that are caught in gear, or some combination of these effects. According to the draft BO, to avoid the likelihood of jeopardizing the continued existence of loggerhead sea turtles, OSF must implement fishery management measures to reduce the number of loggerhead sea turtles that are incidentally captured, injured, killed by gear associated federally-managed fisheries by at least 75 percent from current (that is, a reduction in the number of loggerhead sea turtles captured, injured, or killed compared with a running average of the number captured, injured, or killed during the period 1993 to 1999) levels.

The draft BO requires OSF to lessen the impact of the pelagic longline fishery upon loggerhead and leatherback sea turtles, and ensure takes decrease in future years because:

- (1) of the current status of the loggerhead population;
- (2) the levels of incidental take of the April 28, 1999, BO were exceeded for this species;
- (3) the SEFSC's revised estimates of incidental take levels for sea turtles indicates that takes in this fishery over the years have actually been much higher than previously believed;
- (4) the time/area closures included in the final actions this document could increase incidental take levels for sea turtles; and,
- (5) the largely unquantifiable nature of most of these potential changes.

As more information becomes available regarding the status of these populations, it may be necessary to implement additional restrictions to further reduce incidental takes.

Under the terms of the draft BO, the reduction in the number of loggerhead sea turtles that are incidentally captured, injured, or killed in gear can be accomplished directly by gear modifications or it can be accomplished indirectly by changing the method by which gear is deployed. Indirect modifications can include:

- (a) Managing fisheries that use harmful gear over time and space to eliminate the likelihood of interactions between loggerhead sea turtles and gear (proportional to the threat posed by specific gear);

- (b) Managing fisheries to eliminate the likelihood that loggerhead sea turtles captured by gear would drown before they can be released (such as keeping soak times to less than 30 to 45 minutes);
- (c) Excluding gear from areas that, based on available data, appear to be important for loggerhead sea turtles; or,
- (d) Any combination of these changes that reduce the number of loggerhead sea turtles that are incidentally captured, injured, and killed by gear associated with federally-managed fisheries by at least 75 percent from current levels.

According to the draft BO, if OSF cannot develop and implement management measures that reduce the number of loggerhead sea turtles that are incidentally captured, injured, and killed by gear associated federally-managed fisheries by at least 75 percent from current levels, OSF must implement the following RPAs, which has three elements:

- (1a) Modifications in Fishing Method (e.g. limiting fishing activity to certain temperatures and time regimes); **or**,
- (1b) Gear Modifications (e.g. allowing the use of only corrodible hooks);
- (2) Exclusion Zones (e.g. temporally and spatially restricting pelagic longline effort in the Grand Banks area); and,
- (3) Enhanced Monitoring.

If the final BO includes a jeopardy finding for leatherback sea turtles, similar or the same RPAs could also apply to this species.

5.8.4 Incidental Take Statement

Section 9 of ESA and Federal regulation pursuant to section 4(d) of ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not a prohibited taking under ESA, provided that such taking is in compliance with the RPMs and TCs of the ITS.

Section 7(b)(4)(c) of the ESA specifies that in order to provide an ITS for an endangered or threatened species of marine mammal, the taking must be authorized under section 101(a)(5) of the Marine Mammal Protection Act of 1972 (MMPA). Since no incidental take has been authorized under section 101(a)(5) of the MMPA, no statement on incidental take of endangered whales is provided and no take is authorized. Nevertheless, OSF must immediately (within 24 hours) notify the nearest NMFS Office of Protected Resources should a take occur.

Regarding anticipated incidental take for the pelagic longline fishery for swordfish, tunas, and sharks, it is hoped that the final actions to reduce bycatch in the pelagic longline fishery, which may slightly increase take levels of sea turtles, will be more than offset by additional

requirements to reduce take and that estimates of incidental takes of sea turtles in this fishery, which are approximately double previously available estimates, will be substantially minimized by the RPAs and RPMs required under the draft BO.

5.8.5 Reasonable and Prudent Measures

Section 7(b)(4) of the ESA requires that when an agency action is found to comply with section 7(a)(2) of the ESA and the proposed action may incidentally take individuals of listed species, NMFS will issue a statement specifying the impact of any incidental taking. It also states that RPMs necessary to minimize impacts, and TCs to implement those measures must be provided and followed to minimize those impacts. Only incidental taking by the Federal agency that complies with the specified TCs is authorized.

The RPMs and TCs are specified as required by 50 CFR § 402.14 (i)(1)(ii) and (iv) to document the incidental take by HMS fisheries and to minimize the impact of that take on sea turtles. These measures and TCs are non-discretionary, and must be implemented by OSF, in order for the protection of section 7(o)(2) to apply. OSF has a continuing duty to regulate the activity covered by this ITS. If the agency fails to require OSF to adhere to the TCs of the ITS through enforceable terms, and/or fails to retain oversight to ensure compliance with these TCs, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of the incidental take, OSF must report the progress of the action and its impact on the species to NMFS as specified in the ITS [50 CFR 402.14(i)(3)].

The draft BO states that the RPMs that are necessary and appropriate to minimize take of listed species include an effective monitoring and reporting system to document take, educating fishermen to reduce the potential for serious injury or mortality of hooked turtles, and assessments of current data to look for trends that may indicate management measures to reduce the number of protected species interactions.

Terms and Conditions

In order to be exempt from the take prohibitions of section 9 of ESA, the early June 2000 draft BO requires OSF to comply with the following TCs, which implement the RPMs described above and outline required reporting/monitoring requirements. These TCs would be non-discretionary:

- 1) Observer coverage;
- 2) Record information on the condition of sea turtles and marine mammals when released;
- 3) Require the presence and use of dipnets and cutting devices on all longline vessels;
- 4) Review the Azore's study when it is completed and review other related studies;
- 5) Provide financial support to genetic research with the ultimate goal of quantifying the various segments of the sea turtle populations;
- 6) Determine and report on the level of reduction that lightsticks could achieve while

- allowing the fishery to continue;
- 7) As an alternative to the observed experimental fishery to modify gear and fishing techniques to reduce sea turtle takes, investigate use of these options via other means (*e.g.* providing support to various studies, performing data analyses, conducting follow-up activities on various information, etc.); and,
 - 8) Analyze the effects on marine mammal and sea turtle bycatch of limiting the length of pelagic longline gear in the Mid-Atlantic Bight area to 24 nm.

5.9. Sea Birds

Sea bird species hooked by Atlantic pelagic longlines include gannets, gulls, and storm petrels. Sea birds are protected under the Migratory Bird Treaty Act; endangered sea birds are further protected under the Endangered Species Act. The United States is developing a National Plan of Action in response to the FAO Plan of Action to reduce incidental seabird takes. Many seabird populations are especially slow to recover from mortality because their reproductive potential is low (one egg per year and late sexual maturation). They forage on the surface but also pursue prey fish at shallow depths making them somewhat susceptible to driftnet and pelagic longline gear. They are possibly at the highest risk during the process of setting and hauling while the gear is at or near the surface.

Incidental take data for seabirds observed entangled in pelagic longlines are summarized in Appendix B. In 1990-1997, 34 seabirds were hooked by pelagic longlines; 9 were released alive. Seabirds are more often hooked on pelagic longlines as the gear is being set. The birds eat the bait and then become hooked on the line. The line sinks and the birds are subsequently drowned. Anecdotal information suggests that other fisherman also encounter sea birds while fishing for Atlantic HMS.

NMFS has not identified a need to implement gear modifications to reduce takes of sea birds in the pelagic longline fisheries; takes of sea birds are minimal in this fishery in the Atlantic, probably due to night setting of the longlines or fishing in areas where there are not significant numbers of birds. Alexander *et al.* (1997) provides a for additional possibilities of mitigating measures for sea bird mortality in longline fisheries.

6.0	DESCRIPTION OF THE PELAGIC LONGLINE FISHERY FOR ATLANTIC HMS	6-1
6.1	Pelagic Longline Gear	6-1
6.2	Pelagic Longline Catch and Discard Patterns	6-2
6.2.1	U.S. Catch in Relation to International Catch of Atlantic Highly Migratory Species	6-3
6.2.2	Marine Mammals	6-4
6.2.3	Sea Turtles	6-4
6.3	Regional U.S. Pelagic Longline Fisheries Description	6-4
6.3.1	The Gulf of Mexico Yellowfin Tuna Fishery	6-5
6.3.2	The South Atlantic ~ Florida East Coast to Cape Hatteras Swordfish Fishery	6-5
6.3.3	The Mid-Atlantic and New England Swordfish and Bigeye Tuna Fishery	6-6
6.3.4	The U.S. Atlantic Distant Water Swordfish Fishery	6-6
6.3.5	The Caribbean Tuna and Swordfish Fishery	6-6
6.3.6	Regional Pelagic Longline Catches	6-7
6.3.7	Pelagic Longline Vessel Characteristics	6-11
6.4	Economics of Pelagic Longline Fishing	6-12
6.4.1	Costs	6-12
6.4.2	Revenues	6-14
6.4.3	Imports	6-15
6.5	Management of the U.S. Atlantic Pelagic Longline Fishery	6-17
Figure 6.1.	Typical U.S. pelagic longline gear.	6-1
Figure 6.2.	Geographic areas used in summaries of pelagic logbook data from 1992 - 1998.	6-5
Figure 6.3.	Frequency distribution, by homeport state, of pelagic longline vessels with directed or incidental limited access HMS permits	6-11
Figure 6.4.	Distribution of vessel lengths with home ports from the Gulf of Mexico, the southeastern U.S. Atlantic coast (south of 36° N latitude) and northeastern U.S. Atlantic coast (north of 36° N latitude).	6-12
Table 6.1.	Average Number of Hooks per set, 1995 through 1998.	6-2
Table 6.2.	Reported total annual catch of species caught by U.S. Atlantic pelagic longlines, in number of fish 1995 through 1998	6-2
Table 6.3.	Annual Proportion of Billfish in the U.S. Pelagic Longline Catch in 1995	6-3
Table 6.4.	Percentage of U.S. pelagic longline catches (landings + discards) as a proportion of the total annual reported ICCAT catches.	6-4
Table 6.5.	Regional Swordfish Pelagic Longline Catch: 1997 and 1998	6-7
Table 6.6.	Regional Pelagic longline catches of tunas (mt whole weight), by year and area, by U.S. pelagic longline fleet	6-8
Table 6.7.	Number of blue marlin, white marlin and sailfish discarded (dead and alive), by	

	area, from U.S. commercial longline vessels, based on pelagic logbook reports	6-9
Table 6.8.	U.S. commercial dead discards (mt ww) and recreational landing estimates (mt) of Atlantic Marlins for 1994, 1995 and 1996.	6-10
Table 6.9.	Regional U.S. Atlantic Pelagic Longline Catches of Sharks in 1998	6-10
Table 6.10.	Average variable cost per pelagic longline trip for 1996	6-13
Table 6.11.	Average percent and value of the cost components of pelagic longline trips: 1996-1997.	6-13
Table 6.12.	Average characteristics of trips and sets, by region and season.	6-13
Table 6.13.	Index of ex-vessel prices for swordfish and tunas, 1989 - 1998.	6-15
Table 6.14.	Swordfish Import Data Collected under the Swordfish Import Monitoring Program (lbs).	6-16

6.0 DESCRIPTION OF THE PELAGIC LONGLINE FISHERY FOR ATLANTIC HMS

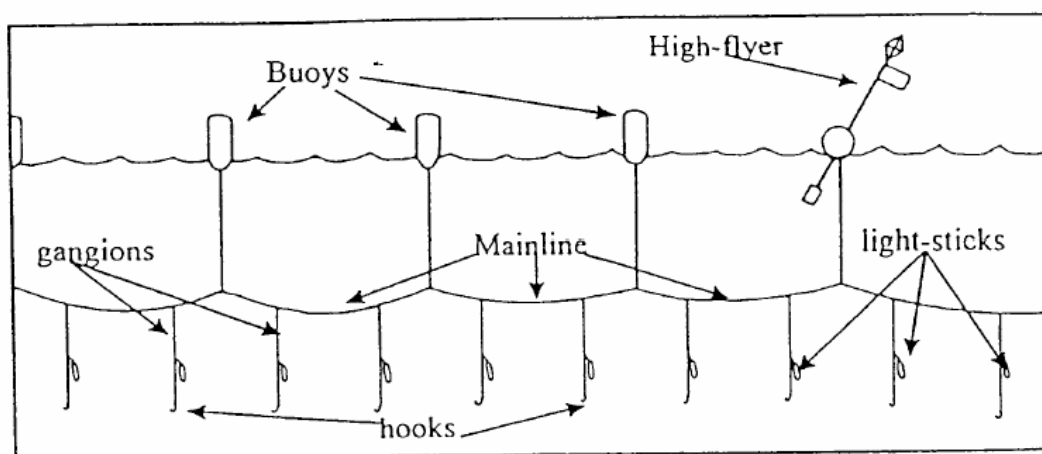
The HMS FMP provides a thorough description of the U.S. fisheries for Atlantic HMS, including sectors of the pelagic longline fishery. Below is specific information regarding the catch of pelagic longline fishermen in the Gulf of Mexico and off the Southeast coast of the United States. For more detailed information on the fishery, please refer to the HMS FMP.

6.1 Pelagic Longline Gear

The U.S. pelagic longline fishery for Atlantic HMS primarily targets swordfish, yellowfin tuna, or bigeye tuna in various areas and seasons. Secondary target species include dolphin, albacore tuna, pelagic sharks including mako, thresher, and porbeagle sharks, as well as several species of large coastal sharks. Although this gear can be modified (i.e., depth of set, hook type, etc.) to target either swordfish, tunas, or sharks, like other hook and line fisheries, it is a multispecies fishery. These fisheries are opportunistic, switching gear style and making subtle changes to the fishing configuration to target the best available economic opportunity of each individual trip. Longline gear sometimes attracts and hooks non-target finfish with no commercial value, as well as species that cannot be retained by commercial fishermen, such as billfish.

Pelagic longline gear is composed of several parts. See Figure 6.1.

Figure 6.1. Typical U.S. pelagic longline gear. Source: Arocha, 1997.



When targeting swordfish, the lines generally are deployed at sunset and hauled in at sunrise to take advantage of the nocturnal near-surface feeding habits of swordfish. In general, longlines targeting tunas are set in the morning, deeper in the water column, and hauled in the evening. Fishing vessels preferentially target swordfish during periods when the moon is full to take advantage of increased densities of pelagic species near the surface, although vessels of the distant water fleet undertake extended trips include other phases of the lunar cycle. The number of hooks

per set varies with line configuration and target catch (Table 6.1).

Table 6.1. Average Number of Hooks per set, 1995 through 1998.

Target Species	1995	1996	1997	1998
Swordfish	500	497	500	485
Bigeye Tuna	831	804	725	732
Yellowfin Tuna	753	750	717	717
Shark	666	662	669	746
Mix	705	724	710	719

6.2 Pelagic Longline Catch and Discard Patterns

The pelagic longline fishery is comprised of five relatively distinct segments/fisheries with different fishing practices and strategies, including the Gulf of Mexico yellowfin tuna fishery, the south Atlantic-Florida east coast to Cape Hatteras swordfish fishery, the mid-Atlantic and New England swordfish and bigeye tuna fishery, the U.S. distant water swordfish fishery, and the Caribbean Islands tuna and swordfish fishery. Each vessel type has different range capabilities due to fuel capacity, hold capacity, size, and construction. In addition to geographical area, segments differ by percentage of various target and non-target species, gear characteristics, bait, and deployment techniques. Some vessels fish in more than one fishery segment during the course of the year. Pelagic longline catch (including bycatch, incidental catch, and target catch) is largely related to these vessel and gear characteristics but is summarized for the whole fishery in Table 6.2, based on information provided through the mandatory pelagic logbooks submitted to the SEFSC.

Table 6.2. Reported total annual catch of species caught by U.S. Atlantic pelagic longlines, in number of fish 1995 through 1998.

Species	1995	1996	1997	1998
Swordfish Kept	72,773	73,169	68,253	67,937
Swordfish Discarded	29,176	23,808	20,483	22,536
Blue Marlin Discarded	2,924	3,280	2,605	1,274
White Marlin Discarded	3,283	2,822	2,776	1,485
Sailfish Discarded	1,124	1,430	1,714	810
Spearfish Discarded	368	549	379	103
Bluefin Tuna Kept	240	208	180	204
Bluefin Tuna Discarded	2,848	1,706	679	1,304
BAYS Kept	119,259	84,977	102,123	74,412
Yellowfin Tuna Kept	82,297	62,869	73,987	48,938
Bigeye Tuna Kept	22,338	17,271	21,328	18,181

Species	1995	1996	1997	1998
Pelagic Sharks Kept	5,871	5,279	5,136	3,607
Pelagic Sharks Discarded	90,193	84,590	82,235	43,998
LCS Kept	58,567	36,047	21,741	11,756
LCS Discarded	11,033	11,486	8,026	5,891
Dolphin Kept	71,541	37,007	63,056	21,678
Wahoo Kept	4,930	3,468	4,569	4,180
Turtles Discarded	1,142	498	267	885
<i>Number of Hooks (X 1,000)</i>	<i>11,036</i>	<i>10,617</i>	<i>9,873</i>	<i>7,617</i>

In the United States, sale of billfish from the Atlantic Ocean is prohibited. The relative magnitude and frequency of encounters of billfish with pelagic longline gear (responsible for most of the commercial bycatch of billfish) affect the approach necessary to reduce this bycatch. The percent of the U.S. longline catch comprised of billfish and estimates of subsequent live releases from pelagic longline gear are shown in Table 6.3.

Table 6.3. Annual Proportion of Billfish in the U.S. Pelagic Longline Catch in 1995, by number.
Source: Cramer, 1996.

Species	Proportion of Catch (percent)	Percent Released Alive
Atlantic blue marlin	0.49	74.4
Atlantic white marlin	0.49	68.8
West Atlantic sailfish	0.20	58.0
Longbill spearfish	0.07	64.7
All species combined	1.26	69.2

6.2.1 U.S. Catch in Relation to International Catch of Atlantic Highly Migratory Species

The United States harvests only a portion of the Atlantic-wide catch of highly migratory species (Table 6.4). In 1998, U.S. fishermen (commercial dead discards and recreational landings) accounted for only 1-3 percent of the Atlantic billfish fishing mortality (depending on species). For tunas, the U. S. fishery accounts for variable proportions of the Atlantic-wide mortality: 47 percent for West Atlantic bluefin tuna, almost 4 percent for yellowfin tuna, and a much smaller proportion of skipjack, bigeye tuna, and albacore tuna mortality. The United States accounted for 25 percent of the north Atlantic swordfish catch. Because curbing U.S. fishing alone would not be effective, the United States seeks to work in the international arena to reduce bycatch and bycatch mortality. In some cases, such as marlins, the mortality by U.S. commercial fishermen has only a small impact on the stocks.

Table 6.4. Percentage of U.S. pelagic longline catches (landings + discards) as a proportion of the total annual reported ICCAT catches. Calculations are based on information provided by the 1999 SCRS report. Source: SCRS, 1999.

Species	Stock	1996	1997	1998
Yellowfin Tuna	Atlantic	2.1	2.7	1.7
Bigeye Tuna	Atlantic	0.6	0.8	0.7
Skipjack Tuna	West Atlantic	0.001	0.01	0.004
Albacore Tuna	North Atlantic	0.4	0.6	0.7
Bluefin Tuna	West Atlantic	5.9	3.9	4.3
Blue Marlin	Atlantic	4.4	3.4	1.6
White Marlin	Atlantic	4.4	7.7	2.9
Sailfish	West Atlantic	7.9	14.2	1.8
Swordfish	North Atlantic	27.2	26.3	28.2

Note: Shark catches are reported as bycatch but are insufficient to determine relative proportions.

6.2.2 Marine Mammals

Of the marine mammals that are hooked by pelagic longline fishermen, many are released alive, although some animals suffer serious injuries and may die after being released. Mammals are caught primarily from June through December in the Mid-Atlantic Bight and Northeast Coastal areas. In the past, the incidental catch rate was highest, on average, in the third quarter (July - September) in the Mid-Atlantic Bight. Incidental catch of pilot whales in pelagic longlines is thought to result from pilot whales preying on tuna that have been caught on the gear.

6.2.3 Sea Turtles

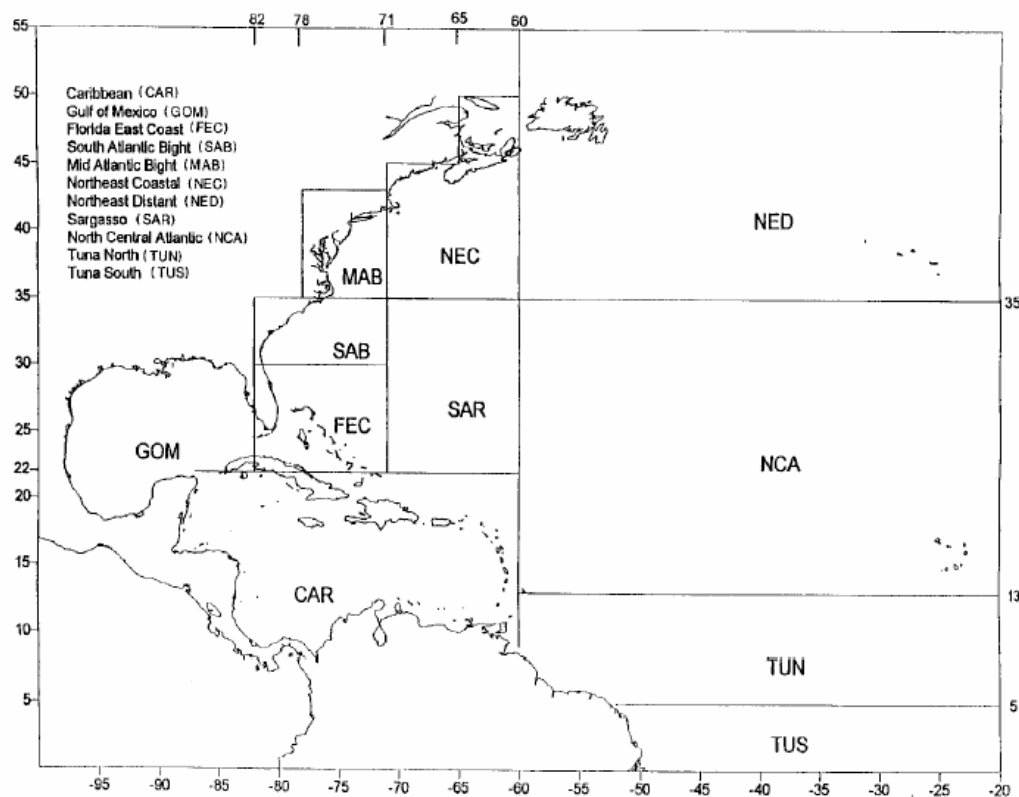
A summary of reported turtle takes from the pelagic logbook from 1995-1998 is provided in Table 6.2. Many of these turtles were taken in the Northeast Coastal (NEC) and Northeast Distant (NED) areas (Figure 6.2) and were released alive. In the past, the bycatch rate was highest in the third and fourth quarters. Loggerhead and leatherback turtles dominate the catch of turtles. In general, sea turtle captures are rare, but takes appear to be clustered (Hoey and Moore, 1999). Further information on sea turtle takes is provided in Section 5.8.

6.3 Regional U.S. Pelagic Longline Fisheries Description

Pelagic longline catch composition varies among the various areas of the operational range of the U.S. commercial fleet in the Atlantic Ocean. Hoey and Moore (1999) summarized historical observer data to describe catch composition of pelagic longline sets made during 1990 to 1997 in the statistical areas shown in Figure 6.2, including: Tropical (TUN, TUS); Caribbean (CAR); Western North Central Atlantic (SAR, NCA); Gulf of Mexico (GOM); Florida East Coast (FEC); South Atlantic Bight (SAB); Mid-Atlantic Bight (MAB); Northeast Coastal (NEC); and

Northeast Distant.

Figure 6.2. Geographic areas used in summaries of pelagic logbook data from 1992 - 1998. Source: Cramer and Adams, 2000.



6.3.1 The Gulf of Mexico Yellowfin Tuna Fishery

These vessels primarily target yellowfin tuna year-round; however, each port has one to three vessels that direct on swordfish either seasonally or year-round. Longline fishing vessels that target yellowfin tuna in the Gulf of Mexico also catch and sell dolphin, swordfish, and other tunas and sharks. During yellowfin tuna fishing, few swordfish are captured incidentally. Many of these vessels participate in other Gulf of Mexico fisheries (targeting shrimp, shark, and snapper/grouper) during allowed seasons. Major home ports for this fishery include Panama City, FL; Destin, FL; Dulac, LA; and Venice, LA.

6.3.2 The South Atlantic ~ Florida East Coast to Cape Hatteras Swordfish Fishery

These pelagic longline vessels primarily target swordfish year-round. Yellowfin tuna and dolphin are other important marketable components of the catch. Smaller vessels fish shorter trips from

the Florida Straits north to the bend in the Gulf Stream off Charleston, South Carolina (Charleston Bump). Mid-sized and larger vessels migrate seasonally on longer trips from the Yucatan Peninsula throughout the West Indies and Caribbean Sea and some trips range as far north as the mid-Atlantic coast of the United States to target bigeye tuna and swordfish during the late summer and fall. Fishing trips in this fishery average nine sets over 12 days. Major home ports (including seasonal ports) for this fishery include Georgetown, SC; Cherry Point, SC; Charleston, SC; Fort Pierce, FL; Pompano Beach, FL; Dania, FL; and Key West, FL. This sector of the fishery consists of small to mid-size vessels which typically sell fresh swordfish to local high-quality markets.

6.3.3 The Mid-Atlantic and New England Swordfish and Bigeye Tuna Fishery

This fishery has evolved during recent years to become an almost year-round fishery based on directed tuna trips, with substantial numbers of swordfish trips as well. Some vessels participate in the directed bigeye/yellowfin tuna fishery during the summer and fall months and then switch to bottom longline fisheries and/or shark fishing during the winter when the large coastal shark season is open. Fishing trips in this fishery sector average 12 sets over 18 days. During the season, vessels primarily offload in the major ports of Fairhaven, MA; Montauk, NY; Barnegat Light, NJ; Ocean City, MD; and Wanchese, NC. Some of these vessels follow the swordfish along the mid-Atlantic coast, then fish off the coast of the southeast United States during the winter months.

6.3.4 The U.S. Atlantic Distant Water Swordfish Fishery

This fleet's fishing grounds range virtually the entire span of the western North Atlantic to as far east as the Azores and the mid-Atlantic Ridge. About ten larger vessels operate out of mid-Atlantic and New England ports during the summer and fall months, and move to Caribbean ports during the winter and spring months. Many of the current distant water operations were among the early participants in the U.S. directed Atlantic commercial swordfish fishery. These larger vessels, with greater ranges and capacities than the coastal fishing vessels, enabled the United States to become a significant player in the north Atlantic fishery. They also fish for swordfish in the south Atlantic. The distant water vessels traditionally have been larger than their Southeast counterparts because of the distances required to travel to the fishing grounds. Fishing trips in this fishery tend to be longer than in other fisheries, averaging 30 days and 16 sets. Principal ports for this fishery range from San Juan, Puerto Rico through Portland, ME, and include Fairhaven, MA, and Barnegat Light, NJ.

6.3.5 The Caribbean Tuna and Swordfish Fishery

This fleet is similar to the southeast coastal fishing fleet in that both are comprised primarily of smaller vessels that make short trips relatively near-shore, producing high quality fresh product. Both fleets also encounter relatively high numbers of undersized swordfish at certain times of the year. Longline vessels targeting HMS in the Caribbean set fewer hooks per set, on average,

fishing deeper in the water column than the distant water fleet off New England, the northeast coastal fleet, and the Gulf of Mexico yellowfin tuna fleet. This fishery is typical of most pelagic fisheries, being truly a multispecies fishery, with swordfish as a substantial portion of the total catch. Yellowfin tuna, dolphin and, to a lesser extent, bigeye tuna, are other important components of the landed catch. Principal ports are St. Croix, U.S. Virgin Island; and San Juan, Puerto Rico. Many of these high quality fresh fish are sold to local markets to support the tourist trade in the Caribbean.

6.3.6 Regional Pelagic Longline Catches

As expected, swordfish dominates the catch in weight along the southeast coast and northeast areas (Table 6.5). Tuna catch dominates in the Gulf of Mexico and in the Mid-Atlantic Bight (Table 6.6). Blue marlin and sailfish are taken most frequently in the Caribbean and Gulf of Mexico; white marlin are also taken in these areas, as well as the northeast coastal area (Tables 6.7 and 6.8). Pelagic sharks and LCS (Table 6.9) are taken most frequently along the Atlantic coast. Further information on the distributional patterns of these species is provided in the HMS FMP and Billfish FMP Amendment.

Table 6.5. Regional Swordfish Pelagic Longline Catch: 1997 and 1998 (reported in pelagic longline ; areas defined as shown in Figure 6.2). Source: Cramer and Adams, 2000.

Area	Number Swordfish Caught	Percent Kept	Percent Discarded Dead	Percent Discarded Alive	Number Swordfish Caught	Percent Kept	Percent Discarded Dead	Percent Discarded Alive
1997					1998			
CAR	8,029	84	7	7	5114	81	11	7
GOM	16,260	68	18	13	11306	74	13	11
FEC	13,200	66	20	13	13954	65	19	14
SAB	11,438	72	16	10	20008	71	15	12
MAB	4,240	53	24	21	7894	62	17	19
NEC	5,360	69	15	14	5877	68	16	14
NED	14,200	88	7	4	15621	84	7	7
SAR	336	91	4	4	25	100	0	0
NCA	2,931	94	2	3	4381	93	3	3
TUN	1,519	85	7	7	1117	79	11	9
TUS	9,114	92	4	3	4410	91	4	3
Total	86,627	76	13	10	89707	75	13	11

Table 6.6. Regional Pelagic longline catches of tunas (mt whole weight), by year and area, by U.S. pelagic longline fleet. Source: NMFS, 1999c.

Area	Tuna Species	1995	1996	1997	1998
NW Atlantic (areas MAB, NEC, FEC, NED)	Yellowfin	1277.6	728.3	838.9	464.9
	Skipjack	0.1	0.1	1.0	0.7
	Bigeye	669.4	333.0	476.3	544.3
	Bluefin	171.9	101.9	56.7	85.3
	Albacore	240.0	63.6	140.0	155.4
Gulf of Mexico (area GOM)	Yellowfin	1934.4	2164.8	2571.3	1864.5
	Skipjack	0.6	0.2	1.3	0.6
	Bigeye	71.4	30.9	33.9	25.6
	Bluefin	42.3	39.5	30.2	25.7
	Albacore	10.3	5.7	16.9	3.9
Caribbean (Areas SAR, NCA, CAR, TUN)	Yellowfin	351	34.2	135.4	58.6
	Skipjack	0.1	0	1.2	0
	Bigeye	109.4	32.8	50.0	48.5
	Bluefin	0	0	0	0
	Albacore	80.3	6.6	16.1	17.8
NC Area 94a	Yellowfin	18.6	319.3	6.1	4.6
	Skipjack	0	0	0	0
	Bigeye	135.3	228.9	91.8	48.4
	Bluefin	0	0	0	1.7
	Albacore	6.2	32.4	11.4	1.6
SW Atlantic (area TUS)	Yellowfin	0	38.4	221.9	55.3
	Skipjack	0	0	0	0
	Bigeye	0	34.9	142.8	28.5
	Bluefin	0	0	0	0
	Albacore	0	1.1	4.7	1.4

Table 6.7. Number of blue marlin, white marlin and sailfish discarded (dead and alive), by area, from U.S. commercial longline vessels, based on pelagic logbook reports . Source: Cramer and Adams, 2000.

Area	Blue Marlin Discards			White Marlin Discards			Sailfish Discards		
	96	97	98	96	97	98	96	97	98
CAR	463	295	156	171	154	118	44	40	38
GOM	646	512	558	490	392	418	586	623	434
FEC	204	171	246	109	100	210	303	192	183
SAB	386	156	130	290	142	126	248	121	108
MAB	53	38	25	315	224	166	20	3	8
NEC	262	54	44	459	419	146	10	3	4
NED	3	3	33	12	8	18	0	1	1
SAR	6	1	0	33	16	0	2	0	0
NCA	137	70	46	160	105	112	21	7	3
TUN	819	605	58	423	251	138	188	222	30
TUS	120	398	29	37	589	42	44	550	26
Total	3,099	2,303	1,295	2,501	2,450	1,494	1,466	1,762	835

Table 6.8. U.S. commercial dead discards (mt ww) and recreational landing estimates (mt) of Atlantic Marlins for 1994, 1995 and 1996. Source: NMFS, 1999c.

	1996	1997	1998	1996	1997	1998	1996	1997	1998
	Atlantic Blue Marlin			Atlantic White Marlin			Atlantic Sailfish		
Northwest Atlantic									
Longline Discards	37.3	18.7	23.3	25.3	11.2	15.3	19.2	9.2	6.4
Rod & Reel	18	25	34.1	2.7	0.9	2.4	0.2	0	0.1
Unclassified			0.62			0.7			0.06
Gulf of Mexico									
Longline Discards	24.7	51	18.5	11.6	15.4	11.8	42.1	13.3	17.0
Rod & Reel	8.3	11.5	4.5	0.6	0.9	0.2	0.8	0.4	1.0
Caribbean									
Longline Discards	124.7	24.6	2.3	26.6	6.6	1.3	8.2	3.3	0.2
Rod & Reel	9.6	8.6	10.6	0	0	0.02	0.2	0.2	0.05
Other	0	0	0	0	0	0	0	0	0
Unknown									
Longline Discards	8.6	2.3	6.1	3.9	0.5	2.8	1.9	0	0.8
Southwest Atlantic									
Longline Discards	1.24	41.5	1.6	0.2	37.1	0.9	0.2	31.9	2.7
All Gear Totals	231.4	183.2	101.6	70.9	72.6	35.4	72.8	58.3	28.3
Rod & Reel Totals	34.9	45.1	49.2	3.3	1.8	2.6	1.2	0.6	1.15
Percent U.S. Reported Mortality Attributed to Pelagic longline gear	84.9	75.4	51.6	95.3	97.5	92.7	98.3	99.0	95.9

Table 6.9. Regional U.S. Atlantic Pelagic Longline Catches of Sharks in 1998. Source:(Task I data submitted to ICCAT, 1999, not a complete set of shark landings)

Region	Pelagic Sharks		Coastal Sharks	
	Dead Discards (number of fish)	Landings (number of fish)	Dead Discards (number of fish)	Landings (number of fish)
Gulf of Mexico	288	393	458	653
Atlantic Coast	3259	2832	2604	6203
Caribbean	129	58	5	0
Atlantic-Distant	2651	662	1	5
South Atlantic	113	17	49	0

6.3.7 Pelagic Longline Vessel Characteristics

An important component to consider in the evaluation of possible impacts of various management alternatives (Section 7) are the physical characteristics of the U.S. pelagic longline fleet, including where vessels are homeported (Figure 6.3). The size of the vessel limits the range within which a pelagic longline vessel can safely operate (distance from home port and from shore). In a recent study of the pelagic longline fleet, Larkin *et al.* (1998) found that the average length of Atlantic pelagic longline vessels in 1996 was 57 feet (range 30-95 feet). The distribution of pelagic longline vessel lengths (by increments of 10 feet) with either a directed or incidental permit that would allow landings of swordfish, tuna and/or sharks are shown in Figure 6.4. Pelagic longline vessels were divided into three groups: vessels with home ports north of 36° N. latitude, those south of 36° N. latitude, and vessels homeported in the Gulf of Mexico. Vessels fishing out of the east coast of Florida to North Carolina are smaller than other areas, with lengths generally 50 feet or less. This is indicative of vessels that make short trips to the swordfish and tuna fishing grounds along the southeastern U.S. coast that are relatively close to shore. Vessels homeported out of the northeastern United States are larger (most over 50 feet), reflecting the distance these vessels must travel to the productive fishing areas. The vessels in the Gulf of Mexico are intermediate in size relative to those along the U.S. Atlantic coast, with the modal group in the 60 foot range.

Figure 6.3. Frequency distribution, by homeport state, of pelagic longline vessels with directed or incidental limited access HMS permits. Source: NMFS permit database, October 1999.

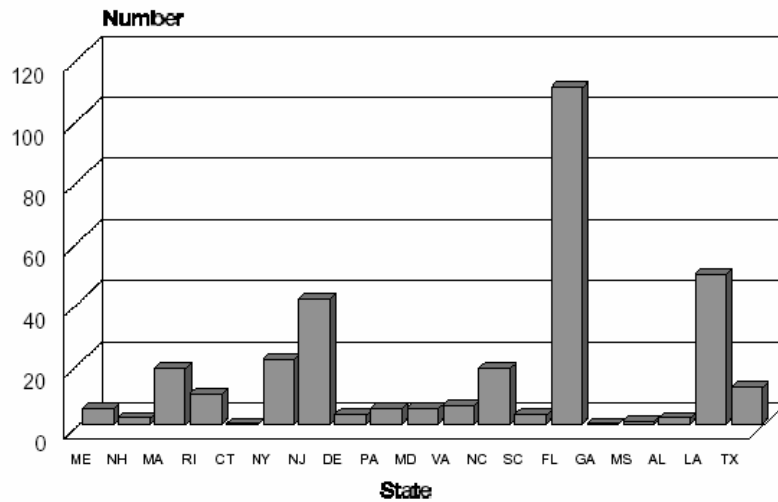
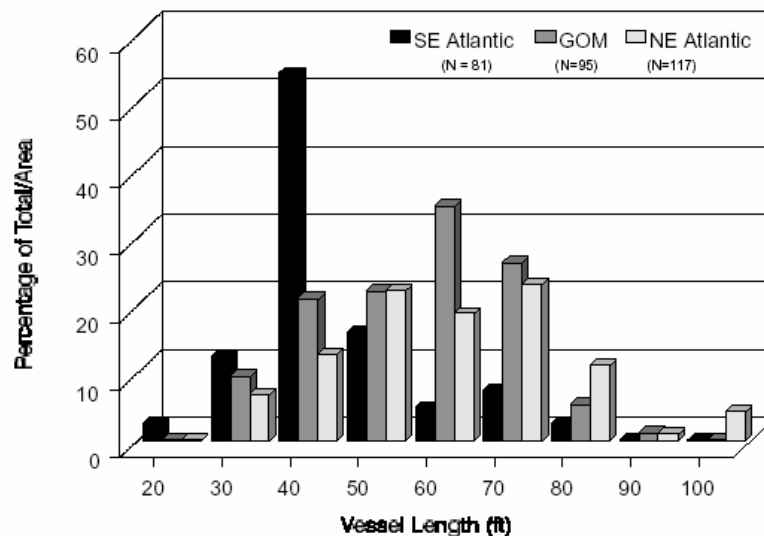


Figure 6.4. Distribution of vessel lengths with home ports from the Gulf of Mexico, the southeastern U.S. Atlantic coast (south of 36° N latitude) and northeastern U.S. Atlantic coast (north of 36° N latitude). Source: NMFS Permit database, October 1999.



6.4 Economics of Pelagic Longline Fishing

6.4.1 Costs

The average cost of a pelagic longline trip was estimated from a description of the voluntary 1996 trip summary report data (Larkin *et al.*, 1998). The data requested on the trip summary forms include cost data for fuel, bait, groceries, light sticks, and miscellaneous expenses (including docking and unloading fees). In addition, the form requested the amounts paid to the crew, captain, and vessel owner per trip. The average costs per trip are summarized in Table 6.10, based on reports from 95 vessels that submitted the voluntary economic information for 488 trips taken during 1996. Ward and Hanson (1999) also examined the pelagic logbook voluntary form. They used data from 1996 through 1998 and found the total average cost per pelagic longline trip to be \$5,284 with a standard deviation of \$6,406 (1,932 trips); these average cost estimates are somewhat lower than the Larkin *et al.* (1998) study that examined only 488 trip (vs 1,932 trips) from 1996 (vs 1996 to 1998 average). They also found in 1996 and 1997 (Table 6.11) that the average trip cost was \$2,965 with a standard deviation of \$4,277 (1,583 trips), not including payments to the captain and crew. Additional data may reduce some of the variability found in the database.

Strand and Mistean (1999) found that Gulf of Mexico vessels use more fuel and light sticks per set, and capture more tuna and swordfish per set than Atlantic vessels (Table 6.12). Note that this study did not consider the distant water fleet in their calculations because they do not represent the majority of the vessels fishing in the Atlantic. Fuel costs are considerably lower in the Gulf but the seasonal economics of the longline fishery (in both the Atlantic and the Gulf) may be largely dependent on the migrations of tunas and swordfish. Large variation in costs, up to \$200 per set, were found to exist depending on the time of year and the area of operation.

Table 6.10. Average variable cost per pelagic longline trip for 1996. Source: Larkin *et al.*, 1998.

Cost Category	Average Cost
Light Sticks	\$801
Fuel	\$1,400
Bait	\$1,506
Ice	\$384
Groceries	\$617
Miscellaneous	\$2,623
TOTAL	\$7,331

Table 6.11. Average percent and value of the cost components of pelagic longline trips: 1996-1997. Source: Ward and Hanson, 1999.

Cost Category	Average Cost
Fuel	\$876
Bait	\$646
Ice	\$350
Freight/Handling	\$350
Groceries	\$441
Light Sticks	\$302
Total	\$2,965

Table 6.12. Average characteristics of trips and sets, by region and season. Source: Strand and Mistean, 1999.

Characteristics	Sample of Atlantic Vessels		Sample of Gulf of Mexico Vessels		Entire Sample
	January-March	April-December	January-March	April-December	January-December
Fuel/trip (gals)	451	715	1660	1684	990
Number of Lightsticks/trip	726	577	1749	755	929

Characteristics	Sample of Atlantic Vessels		Sample of Gulf of Mexico Vessels		Entire Sample
Price of fuel (\$/gal)	1.02	0.99	0.74	0.77	0.91
Price of light sticks (\$/light stick)	0.50	0.52	0.51	0.53	0.52
Swordfish Harvest/set	8.9	11.8	32.8	13.1	14.1
Tuna harvest/set	2.9	13.4	14.0	18.9	13.3
Sets per trip	2.9	3.5	6.0	5.7	4.2

6.4.2 Revenues

Many consumers consider swordfish to be a premier seafood product. Swordfish that bring \$3.00 per pound to the vessel may sell in some restaurants at prices of over \$20.00 for a six-ounce steak. Swordfish prices are affected by a number of demand and supply factors, including the method of harvest, either by distant-water or inshore vessels, and by gear type (harpoon vs. pelagic longline). Generally, prices for fresh swordfish can be expected to vary during the month due to the heavier fishing effort around the period of the full moon. Swordfish prices also vary by size and quality, with prices first increasing with size, up to about 250 lbs, then decreasing due to higher handling costs for larger fish. “Marker” swordfish weighing 100 to 275 lbs are preferred by restaurants because uniform-sized dinner portions can be cut with a minimum of waste. “Pups” weighing 50 to 99 lbs dw are less expensive than markers but the yield of uniformly sized portions is smaller. “Rats” (33 to 49 lbs dw) are the least expensive but are generally not used by food service or retail buyers who require large portions of uniform size. Larger tunas are also more desirable than smaller ones with prices for tunas ranging from \$1.00-1.50 for 0-29 pound yellowfin tuna to \$1.50-3.00 for 50+ pound yellowfin tuna (Strand and Mistean, 1999). Size of fish harvested can be a substantial factor in management because regulations might have the effect of reducing catch but might raise the average size per fish caught and therefore, raise the price.

However, just as costs can vary seasonally and depending on region, prices also might exhibit patterns at different ports and during different times of the year. Demand for swordfish was shown to be stronger during the second and third quarters of the year (Thunberg and Seale, 1992), reflecting the popularity of swordfish steaks during the barbecue and seaside tourist seasons. There is evidence of regional differences in price. The eastern Gulf of Mexico, for example, receives relatively low prices for swordfish and near average prices for tuna (Strand and Mistean, 1999).

ICCAT quotas for Atlantic swordfish have decreased. Although studies (Gauvin 1990; Thunberg and Seale, 1992) demonstrate that ex-vessel gross revenues may rise as supply decreases and as U.S. consumer income rises, U.S. prices have declined over the past four years (Table 6.13). The combination of decreased prices and decreased quota indicates that total gross revenues for the

fleet as a whole have probably declined as well. Declining prices for swordfish may be the result of substitution with imports which occur during critical months of the year; imports of swordfish have increased dramatically in recent years. The relatively strong U.S. dollar and weak Japanese Yen may be drawing fish that were formerly marketed in Asia to the domestic market, including swordfish and steak-grade tuna that compete with U.S. domestic swordfish.

Table 6.13. Index of ex-vessel prices for swordfish and tunas, 1989 - 1998. Base year is 1982. Source: NMFS, 1999a.

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Swordfish	119	108	102	111	92	107	104	103	91	70
Tunas	108	112	126	97	117	181	212	105	118	96

6.4.3 Imports

NMFS has identified 69 swordfish importers who have imported swordfish since the swordfish import permitting, reporting and small fish restrictions were implemented in June 1999. Recent import data collected from the importer activity reports (part of dealer bi-weekly reports) and the Certificates of Eligibility are summarized in Table 6.14. These data are limited because the program was not implemented until mid-year 1999.

Dealers submit reports to NMFS on swordfish sales that include the weight and price of the fish. The processing and wholesale sectors are an integral part of the U.S. swordfish industry and are described in detail in the HMS FMP. The sector that might be most affected by this rulemaking is the primary processing sector, notably those firms that purchase the raw product from fishermen or importers and transform it into a consumer product. Secondary processors provide restaurants and food service distributors with loins or “wheels” (large bone-in sections cut through the body).

Other participants involved in the commercial trade sector of the Atlantic swordfish fishery include brokers, freight forwarders, carriers (primarily commercial airlines), and consignees. Brokers are private individuals or companies who are hired by importers and exporters to help move their merchandise through U.S. Customs with the proper paperwork and payments. The broker must possess thorough knowledge of tariff schedules and U.S. Customs regulations and keep abreast of changes in the law and administrative regulations. Freight forwarders often arrange for land transportation and storage facilities for the incoming shipment. The nominal or an ultimate consignee is the person who “owns” the shipment of swordfish.

Table 6.14. Swordfish Import Data Collected under the Swordfish Import Monitoring Program (lbs). June - September 1999 totals. Based on data received through November 15, 1999.

Flag Country of Vessel	Ocean of Harvest				Total
	Atlantic	Pacific	Indian	Unknown	
Australia	0	394060.3	72900.7	6938.8	473899.8
Brazil	796966.8	0	0	0	796966.8
Canada	565248	0	0	0	565248
Chile	0	901326.5	0	0	901326.5
Columbia	0	192.5	0	0	192.5
Costa Rica	0	257504.3	0	0	257504.3
Ecuador	0	52658.3	0	0	52658.3
El Salvador	0	8768	0	0	8768
Fiji Islands	0	52017.6	0	0	52017.6
Grenada	2607	0	0	0	2607
Guam	0	1905	0	0	1905
Indonesia	0	0	74854.3	0	74854.3
Japan	0	163100	0	0	163100
Mexico	0	101845.4	0	0	101845.4
Micronesia	0	542	0	0	542
Namibia	0	0	0	0	0
Netherlands	1597	0	0	0	1597
New Zealand	0	177731.9	0	0	177731.9
Panama	0	243.9	0	0	243.9
Peru	929.4	2374	0	0	3303.4
Philippines	0	30568	0	0	30568
Samoa	0	1204	0	0	1204
South Africa	1262258	0	0	0	1262258
Taiwan	100348	29400	253721.9	0	2666967
Trinidad	837	0	0	0	837
Uruguay	156845.1	0	0	0	156845.1
Vietnam	0	5044.1	0	0	5044.1
Unknown	0	0	0	332113.7	332113.7
Totals	2887636.2	2180485.8	2684974.1	339052.5	8092148.6

6.5 Management of the U.S. Atlantic Pelagic Longline Fishery

The U.S. Atlantic pelagic longline fishery is subject to numerous management measures designed to meet conservation goals, as well as provide scientific information for optimal management of these resources. The pelagic longline fishery is restricted to catching a limited swordfish quota, divided between the North and South Atlantic (separated at 5° N. latitude). Other regulations include minimum sizes for swordfish, yellowfin, bigeye, and bluefin tuna, limited access permitting, reporting requirements (including logbooks and vessel monitoring systems), and gear requirements (temporary restrictions on length of line). The pelagic longline fishery is subject to a high level of management, and as such, is strictly monitored to avoid overharvest of the swordfish quota and to monitor bycatch.

Pelagic longline fishermen and the dealers who purchase highly migratory species from them are also subject to reporting requirements. NMFS has extended dealer permitting and reporting requirements to all swordfish importers as well as dealers who buy domestic swordfish from the Atlantic. These data are used to evaluate the impacts of harvesting on the stock and the impacts of regulations on affected entities.

Current billfish regulations prohibit the retention of billfish by commercial longline vessels, and the sale of billfish from the Atlantic Ocean. As a result, all billfish hooked on longlines must be released, and are considered bycatch.

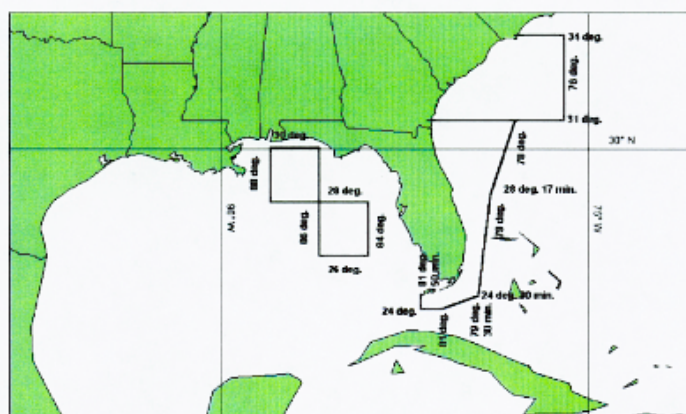
Pelagic longlines were not historically part of the bluefin tuna fishery in the United States. For this reason, their catch is considered incidental and NMFS has implemented regulations to discourage longline fishermen from targeting bluefin tuna and to limit the incidental catch of this species. As a result of these regulations, bluefin tuna are often discarded.

In 1997, NMFS convened the Longline Advisory Panel which investigated strategies for comprehensive management of this fishery, because of its multispecies nature. The meetings of that group with NMFS staff resulted in a report to Congress which outlined possible changes in management to address fishermen's concerns. NMFS will continue to use this document to guide management in an effort to move towards ecosystem management of Federal fisheries. That report supported limited access, which is currently in place for pelagic longline fishermen targeting Atlantic highly migratory species. Limited access imparts a greater vested interest in the future of the fishery, and provides incentive for stock rebuilding and bycatch reduction. Further, the HMS and Atlantic Billfish APs have considered numerous pelagic longline issues in the development of the HMS FMP, Billfish FMP Amendment, and this final rule.

PAGES 7-1 THROUGH 7-15 INTENTIONALLY OMMITTED

Final Action: Closure of the DeSoto Canyon area and the East Florida Coast area year-round; Closure of the Charleston Bump area February 1-April 30.

Figure 7.2. Geographic boundaries for DeSoto Canyon, East Florida Coast and Charleston Bump.



Background and Summary of Additional Analytical Procedures

During the comment period for the proposed HMS bycatch rule, NMFS received many comments indicating that the DeSoto Canyon area located in the eastern Gulf of Mexico should be closed to pelagic longline effort due to the historically high occurrence of undersized swordfish in that location. Although NMFS had analyzed closures in the Gulf of Mexico in the November 1999 Draft Technical Memorandum which encompassed the DeSoto Canyon sub-region, NMFS responded to this comment by preparing an April 26, 2000, federal register notice (65 FR 24440), including a summary of biological, economic, and social impacts associated with closure of this area. Briefly, procedural methods involved examining logbook information dating back to 1993 (1995 was used in the previous analysis) through 1998 (which was unavailable at the time the proposed rule was prepared) for the area bounded by 84°W to 90°W longitude and 26°N to 30°N latitude. This large area in the northeastern Gulf of Mexico was then subset into 2° X 2° (latitude X longitude) blocks, noting inter-annual and intra-annual changes of target and discard catch-per-unit-effort and ratios of target catch to discards, where appropriate (e.g., swordfish kept vs. swordfish discarded). Following this procedure, two blocks were identified for potential year-round closure: 86°W to 88°W longitude and 28°N to 30°N latitude; and 84°W to 86°W longitude and 26°N to 28°N latitude. A summary of pelagic longline catch and discards of swordfish in these areas between 1993 and 1998 is provided in Table 7.2. The northwest block of the DeSoto Canyon area falls within the GulfC closure. The lower, southeastern block of the DeSoto Canyon is located within the GulfD area, which was examined in the Draft

Technical Memorandum, which was made available to the general public in November 1999, and was included as an attachment to the DSEIS.

Table 7.2. Summary of the annual (1993 through 1998) number of swordfish kept and discarded, number of hooks used, and annual ratio of swordfish kept to swordfish discarded from the two blocks identified for closure in the northeastern Gulf of Mexico (DeSoto Canyon).

Year	Swordfish Kept	Swordfish Discarded	Ratio Kept/Discarded	Number of Hooks
1993	1,685	2,370	0.71	482,881
1994	1,630	3,816	0.43	464,803
1995	1,125	1,195	0.94	312,172
1996	2,769	1,983	1.40	354,307
1997	182	1,188	1.50	272,737
1998	968	476	2.03	233,495
Total	9,959	11,028	0.90	211,395

Comments on the proposed rule and DSEIS also indicated that the proposed closures along the U.S. southeast Atlantic coast would have a significant economic and social impact on pelagic longline vessels and on shore-side businesses that operate in the area. There was also concern voiced regarding the biological, social and economic impacts of vessels that displace effort into areas open to fishing. The level of turtle takes by the pelagic longline fishery, particularly from the Northeast Distant area also provided further rationale for examining strategies that would reduce the level of effort redistribution, particularly in the fall months. To respond to these concerns, an evaluation was made of the catch patterns within the SATLE to determine if changes could be made to the temporal and/or spatial components of this closure that would address the four over-arching objectives of the FSEIS, *but at the same time*, minimize economic and social impacts related to effort redistribution.

After a qualitative review of the logbook information from pelagic longline sets made in SATLE over the four year period between 1995 through 1998, the area was sub-divided into two smaller areas separated at the 31°N latitude line (slightly north of the Florida/Georgia border). The U.S. coastline remains as the western border of the closures; the eastern boundaries of SATLE also remain unchanged. For ease in reference, the northern area of SATLE between 31°N and 34°N will be designated as the "Charleston Bump" area and the area south of 31°N will be referred to as the "East Florida Coast" closure. Monthly patterns of effort (number of hooks), swordfish kept, swordfish discarded, catch-per-unit-effort, ratio of swordfish kept to swordfish discarded, and monthly total discards as a percent of the total annual discards were summarized for the two areas to assist in the process of identifying any patterns that could be used to reduce the time an area is closed, while still achieving the objectives of the agency action (Table 7.3 and Table 7.4).

Table 7.3. Summary of monthly catch and discards of swordfish between 1995 through 1998 in the Charleston Bump area.

Month	Number of Hooks	Swd Kept	Swd Discarded	Swd Kept CPUE x 1000 hooks	Swd Discard CPUE x 1000 hooks	Ratio Kept/Discard	Percent of Area Annual Discards
Jan	226,459	566	329	2.50	1.45	1.72	5.1
Feb	293,918	1842	1079	6.27	3.67	1.71	16.7
Mar	471,423	3850	2634	8.17	5.59	1.46	40.7
Apr	325,295	1532	989	4.71	3.04	1.55	15.3
May	345,522	1384	506	4.00	1.46	2.73	7.8
June	233,423	1160	312	5.00	1.34	3.72	4.8
July	60,043	316	124	5.26	2.06	2.55	1.9
Aug	20,712	185	44	8.93	2.12	4.20	0.7
Sept	16,603	145	15	8.73	0.90	9.67	0.2
Oct	28,464	289	205	10.15	7.20	1.41	3.2
Nov	15,340	164	116	10.69	7.56	1.41	1.8
Dec	20,335	156	113	7.67	5.56	1.38	1.7
Total	2,057,537	11,589	6466	5.63	3.14	1.79	

Table 7.4. Summary of monthly catch and discards of sword fish between 1995 through 1998 in the East Florida Coast area.

Month	Hooks x 1000	Swd Kept	Swd Discarded	Swd Kept CPUE x 1000 hooks	Swd Discard CPUE x 1000 hooks	Ratio Kept/Discard	Percent of Area Annual Discards
Jan	215,874	2859	2337	13.24	10.83	1.22	7.8
Feb	201,966	1805	1485	8.94	7.35	1.22	4.9
Mar	243,922	3266	2441	13.39	10.01	1.34	8.1
Apr	366,192	4183	2232	11.42	6.09	1.87	7.4
May	452,945	4115	2070	9.08	4.57	1.99	6.9
June	355,864	5518	2410	15.51	6.77	2.29	8.0
July	315,727	4923	2148	15.59	6.80	2.29	7.1
Aug	297,399	5296	3060	17.81	10.30	1.73	10.2
Sept	258,314	6490	3104	26.87	12.02	2.24	10.3
Oct	337,472	8063	4057	23.89	12.02	1.99	13.5
Nov	203,898	4097	2284	20.09	11.20	1.79	7.6
Dec	229,280	4124	2421	18.00	10.56	1.70	8.0
Total	3,478,853	55,189	30,049	15.87	8.64	1.84	

The information provided in Tables 7.3 and 7.4 was examined to determine the number of swordfish landed and discarded, both in terms of numerical dominance and in catch-per-unit-effort. Temporal variations in the ratio of swordfish kept to swordfish discarded were also evaluated to identify times of the year when more swordfish are discarded relative to the number kept. A total of six temporal and spatial alternatives to the SATIE closure were identified from this evaluation process (Table 7.5).

Table 7.5. Closure alternatives for the Charleston Bump and East Florida Coast sub-areas of SATIE.
Months open to fishing are shaded and designated with a "O"; months closed to pelagic longline fishing are designated with a "C."

Closure Options		J	F	M	A	M	J	J	A	S	O	N	D
Alternative 1: SATIE Jan to Dec <i>Closed 12 months</i>		C	C	C	C	C	C	C	C	C	C	C	C
Alternative 2: SATIE Nov to April <i>Closed 6 months</i>		C	C	C	C	O	O	O	O	O	O	C	C
Alternative 3: N of 31 N: Open S: of 31 N: Closed <i>Some area open all year</i>	N	O	O	O	O	O	O	O	O	O	O	O	O
	S	C	C	C	C	C	C	C	C	C	C	C	C
Alternative 4: N of 31 N: Feb-May S: of 31 N: Nov - Apr <i>Closed 3 months</i>	N	O	C	C	C	C	O	O	O	O	O	O	O
	S	C	C	C	C	O	O	O	O	O	O	C	C
Alternative 5: N of 31 N: Feb-July S: of 31 N: Aug-Jan <i>Some area open all year</i>	N	O	C	C	C	C	C	C	O	O	O	O	O
	S	C	O	O	O	O	O	O	C	C	C	C	C
Alternative 6: N of 31 N: Feb-Apr S: of 31 N: All year <i>Closed 3 months</i>	N	O	C	C	C	O	O	O	O	O	O	O	O
	S	C	C	C	C	C	C	C	C	C	C	C	C

The next step in identifying a subset alternative to the SATIE area was to apply the no effort redistribution and effort redistribution models to each of the five alternatives to determine if any of the subsets provided similar bycatch and incidental catch reductions (Objective 1), minimally impacted target catch (Objective 2), and altered incidental catches of other species (Objective 3). The results of the two models are presented in Table 7.6. For each species, the "best" alternative to the SATIE closure, in terms of meeting the objectives of the FSEIS, is shaded.

Following this iterative process, Alternative 6 (Closure of Charleston Bump during February through April, and East Florida Coast year-round) provided results most similar to SATIE in terms of reducing swordfish discards and maintaining catch of target species of swordfish and

BAYS tunas. Under the effort redistribution model, the final action was better than the preferred southeastern Atlantic closure identified in the DSEIS (SAtLE) in reducing sailfish discards, and did not increase bycatch of blue marlin, white marlin, and turtles to the degree expected under the preferred alternative of the proposed rule. Target catch of dolphin and large coastal sharks were also less impacted by final action than by the preferred alternative in the DSEIS.

Table 7.6. Comparison of time-area options under no effort redistribution and effort redistribution models.

Area/ Alternatives	Portion of Catch Attempting to Reduce							Minimize Impacts on this Portion of Catch					
	Swd discard	BUM discard	WHM discard	SAI discard	BFT discard	Turtle caught	P.sharks discard	LCS discard	Swd kept	BAYS kept	Dolphin kept	P. sharks kept	LCS kept
No Displacement Model: 1995 through 1998													
1) SATIE closed all year	-38.03	-11.36	-5.94	-25.82	-0.93	-1.86	-2.29	-45.81	-23.67	-4.00	-50.86	-9.03	-36.61
2) SATIE closed Nov - April	-19.23	-3.15	-2.03	-5.22	-0.41	-0.72	-1.65	-22.71	-10.08	-2.33	-7.24	-5.44	-26.98
3) N: open all year S: Closed all year	-31.30	-10.20	-3.80	-23.94	-0.67	-1.46	-1.13	-29.96	-19.56	-1.36	-23.56	-5.24	-19.56
4)N: closed Feb-May S: closed Nov- Apr	-19.17	-3.39	-2.59	-5.59	-0.27	-0.68	-1.43	-20.00	-7.40	-2.54	-22.39	-4.93	-21.76
5)N: closed Feb-July S: closed Aug to Jan	-14.70	-6.01	-3.10	-11.36	-0.37	-0.82	-1.34	-23.25	-14.70	-3.13	-28.56	-4.51	-12.59
6) N: closed Feb-Apr S: Closed all year	-36.20	-10.56	-4.54	-24.38	-0.70	-1.65	-1.83	-36.55	-22.02	-3.21	-26.60	-7.10	-26.50
Displacement Model 1995 through 1998													
1) SATIE closed all year	-27.69	7.74	11.40	-11.30	17.31	8.41	10.18	-35.53	-10.76	10.42	-42.56	7.00	-22.05

Area/ Alternatives	Portion of Catch Attempting to Reduce							Minimize Impacts on this Portion of Catch					
	Swd discard	BUM discard	WHM discard	SAI discard	BFT discard	Turtle caught	P.sharks discard	LCS discard	Swd kept	BAYS kept	Dolphin kept	P. sharks kept	LCS kept
2) SAtIE closed Nov - April	-13.21	8.67	6.75	1.11	2.16	1.12	2.47	-18.04	-2.44	3.46	-5.33	2.46	-17.91
3) N: open all year S: Closed all year	-24.69	-0.64	5.85	-16.08	9.56	6.49	8.17	-22.56	-12.02	8.31	-15.01	4.23	-11.73
4)N: closed Feb-May S: closed Nov- Apr	-13.04	9.12	6.95	2.24	2.73	1.09	2.60	-14.18	-2.73	3.56	-18.57	3.66	-12.02
5)N: closed Feb-July S: closed Aug to Jan	-16.36	3.63	5.70	-3.70	6.71	5.24	6.92	-15.82	-6.61	5.36	-22.79	4.12	-3.97
6) N: closed Feb-Apr S: Closed all year	-27.32	5.36	9.71	-13.20	10.75	7.13	8.45	-27.86	-11.29	8.33	-16.44	5.89	-14.74

Population Effects on Bycatch Species

The DeSoto Canyon area would eliminate approximately 32,860 nm² miles of ocean to the use of pelagic longline gear by U.S. commercial fishermen (Figure 7.2). The DeSoto Canyon portion of this final action would result in the following changes in bycatch under the **no effort redistribution** model: swordfish discards reduced by 5%, blue and white marlin discards reduced by 1 and 2% , respectively, and sailfish discards reduced by 5%. This closed area has virtually no effect, positive or negative on sea turtle populations if fishing effort is not redistributed. Target catch of swordfish, BAYS tunas, and pelagic sharks would all be reduced by approximately 2%. Under the **effort redistribution** model, the DeSoto Canyon portion of this final action would have the following results: swordfish discards reduced by 4%, blue and white marlin increased by 1% each, and sailfish discards reduced by 1%. This closed area would not have any population effects on sea turtles if it is assumed that fishing effort is redistributed throughout the Gulf of Mexico. Target catch of swordfish, dolphin and pelagic sharks would all be reduced by less than 2%, while catches of yellowfin tuna would increase by nearly 2%.

The DeSoto Canyon closure will be implemented on November 1, 2000, or approximately 90 days after the target date for publication of the final rule on August 1, 2000. The three month delay in implementing the year-round closure in this area to allow affected businesses to move their base of operation will potentially result in additional discards of approximately 140 swordfish, 10 blue marlin, 8 sailfish, and 15 white marlin, based on average annual discards of these species for August through October. Delay of the closure will also allow additional retention of target catches of swordfish (260 fish) and yellowfin tuna (550 fish), again based on average landings for this three month period.

The Charleston Bump area is approximately 49,090 nm² of ocean and the East Florida Coast area is approximately 50,720 nm² of ocean (Figure 7.2). Collectively, the year-round closure of the East Florida Coast and the February through April closure of the Charleston Bump areas of this final action would result in the following changes in bycatch under the **no effort redistribution** model: swordfish discards reduced by 36%, blue and white marlin discards reduced by 11 and 5%, respectively, and sailfish discards reduced by 24%. This closed area could decrease turtle interactions by 2% if we assume that fishing effort is not redistributed. Under the **effort redistribution model**, the combined Charleston Bump and East Florida Coast closures, the following results would be predicted: swordfish discards *reduced* by 27%, blue and white marlin *increased* by 5 and 10%, respectively, and sailfish discards *reduced* by 13%. This closed area could *increase* sea turtle interactions by 7% if we assume that fishing effort is redistributed throughout the Gulf of Mexico or the Atlantic Ocean, including the Caribbean Sea. Target catch would be *reduced* for swordfish (11%) and dolphin (16%), while catches of yellowfin tuna (8%), bigeye tuna (10%) and pelagic sharks (5%) would *increase*.

The Charleston Bump and East Florida Coast closures will be implemented on February 1, 2001, or approximately 180 days after the target date for publication of the final rule on August 1, 2000. The six month delay in implementing the year-round closure in this area to allow affected

businesses to move their base of operation will have no impact on the Charleston Bump area, which will be closed only during February through April of each year. However, the 180-day delay in closing the East Florida Coast area could potentially result in additional discards of approximately 4300 swordfish, 125 blue marlin, 122 sailfish, and 26 white marlin, based on average annual discards of these species for the period between August through January. Delay of the closure will also allow additional retention of target catches of swordfish (7800 fish) and yellowfin tuna (300 fish), again based on average landings for this six month period.

Combined, the areas of this final action encompass approximately 132,670 nm² of ocean which would be closed to Atlantic pelagic longline fishermen on a seasonal basis. For the combined Gulf of Mexico (DeSoto Canyon) and southeast Atlantic coast (Charleston Bump and East Florida Coast) areas, the **no effort redistribution** model from the 1995 through 1998 pelagic logbook database resulted in the following percent reductions of incidental catch and bycatch (Figure 7.3): swordfish discards, 42%; blue marlin discards, 12%; white marlin discards, 6%; sailfish discards, 30%; bluefin tuna discards, 1% (when combined with the June closure, the net effect on bluefin tuna discards is a 54% reduction)¹; and sea turtles, 2%. Under the no effort redistribution model, target and incidental landings are also reduced, including: swordfish, 25%; BAYS tunas, 5% (yellowfin tuna, 6%; bigeye tuna, 1%); dolphin, 30%; pelagic sharks (kept and discarded), 9% and 2%, respectively; and large coastal sharks (kept and discarded), 32% and 43%, respectively.

Under the **redistribution of effort** model for the combined Gulf of Mexico and southeast U.S. Atlantic coast areas, the final action *reduced* swordfish discards by 31% and sailfish discards by 14%. The discards of blue marlin and white marlin *increased* by 7% and 11%, respectively, when effort was redistributed from the closed areas. Bluefin tuna discards also increased by 11% when pelagic longline effort was randomly redistributed throughout the operational range of the U.S. Atlantic pelagic longline fishery; however when combined with the June closure, the *net effect* on bluefin tuna is a 39% *reduction* in discards. Target landings of swordfish were *reduced* under this closure alternative (13%), as were dolphin (18%), but landings of several target species *increased* when pelagic longline effort was redistributed, including BAYS tunas (10%), and pelagic sharks (4%). The incidental catch of sea turtles also increased (7%) with pelagic longline effort redistribution. However, the effort redistribution model will tend to over-estimate changes in catch for species with non-random distributions (e.g., turtles in the Grand Banks area) as previously explained. Comments received on the proposed rule concur with NMFS that many of the displaced vessels are too small to fish with pelagic longline gear in areas of high turtle concentrations (e.g., the Grand Banks). Therefore, a 7% increase in turtle takes is expected to be the *maximum* increase.

Blue marlin, white marlin and sailfish discard rates generally increase when effort is redistributed from the closed areas along the SE U.S. Atlantic coast to the remaining open areas of the Atlantic and Gulf of Mexico, including locations of relatively high CPUE for billfish. Blue marlin bycatch

¹ In the draft SEIS, the reduction in bluefin tuna discards was inflated because the analysis included the existing time/area closure off the Mid-Atlantic coast, as discussed above. This analysis separates out that closed area in order for the reader to differentiate the results of each closed area/combination.

rates may be over-estimated by the effort redistribution model because calculation of CPUE in the remaining open areas assumes the species distribution is constant. If the species is concentrated in one area, rather than evenly distributed over the entire open area, results could be skewed. Pelagic longline effort in the Caribbean (fishing areas below 22°N latitude) represents approximately 14.7 percent of the total U.S. Atlantic-wide fishing effort, but accounts for 50% of the total blue marlin discards. These areas were not considered for closure since they are generally located outside U.S. EEZ waters. Closures were limited to the U.S. EEZ to maximize the impact of the closure on all sources of fishing mortality (i.e., both domestic and foreign). Therefore, it is likely that the no effort redistribution model would be more applicable for blue marlin (12 percent reduction in discards). Although white marlin discards were less concentrated in the Caribbean (32% of total Atlantic-wide levels), it is likely that the effort redistribution model also overestimated the impact of shifting pelagic longline effort, particularly in consideration of the size of vessel affected. Pelagic longline vessels fishing from the east coast of Florida to North Carolina are generally smaller than in other areas along the eastern seaboard, with vessel lengths generally 50 feet or smaller (Figure 6.4). Due to the distance of these areas from the continental United States and the size of many of the vessels operating off Florida, Georgia and South Carolina, it seems unlikely that much effort from the SE U.S. would be redistributed into the open Caribbean or southwest Atlantic Ocean. Therefore, the impact of effort redistribution on Atlantic billfish discards may be lower than that predicted by the effort redistribution model. Table 7.7 shows the estimated change in total weight (lbs) of target catch estimated by the model from reported levels for 1995 through 1998 through the pelagic logbook system.

Figure 7.3 Percent change in catch resulting from DeSoto Canyon, Charleston Bump and East Florida Coast closures, 1995 through 1998. Swd-swordfish, BFT-bluefin tuna, BUM-blue marlin, WHM-white marlin, SA1-sailfish, Psh-Pelagic sharks, LCS-large coastal sharks, Turt-turtles, YFT-yellowfin tuna, BET-bigeye tuna, Dol-dolphin, D indicates discards, K indicates fish kept.

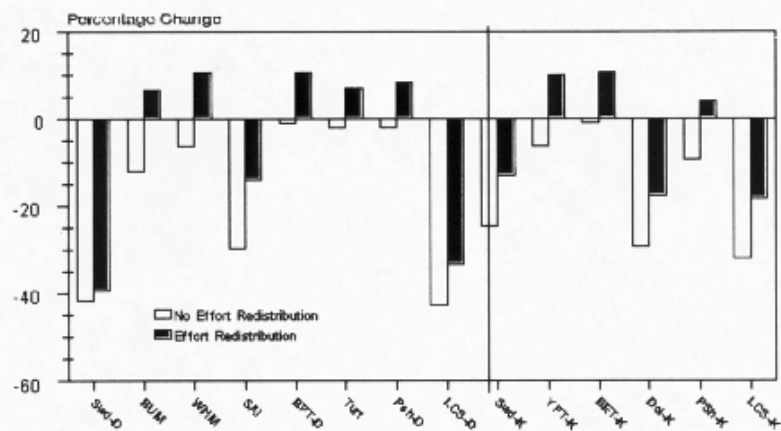


Table 7.7. Impact of the DeSoto Canyon, Charleston Bump and East Florida Coast closures, 1995 through 1998, on the estimated weight of target catch (x 100,000 lbs) "with" and "without" redistribution of effort.

Species	1995		1996		1997		1998	
	Without	With	Without	With	Without	With	Without	With
Swordfish	-9.65	-3.28	-14.38	-6.31	-12.77	-6.73	-16.03	-11.34
BAYS tunas	-13.08	17.10	-13.55	21.11	-9.49	22.62	-7.52	16.97
Bluefin tuna	-0.02	0.07	-0.02	0.07	-0.01	0.04	-0.01	0.05
Pelagic sharks	-1.44	0.63	-1.44	0.62	-1.19	0.62	-0.75	0.32
LCS	-11.92	-5.91	-10.56	-7.07	-3.45	-1.49	-3.48	-2.77
Dolphin	-3.08	-2.19	-1.53	-0.92	-2.38	-1.36	-0.56	-0.19
Wahoo	-0.29	0.10	-0.18	0.11	-0.21	0.15	-0.24	0.17

Effects on Bycatch of Other Species and Resulting Population and Ecosystem Effects

Under the no effort redistribution model, discards of swordfish would be reduced similar to levels noted for the preferred alternative identified in the DSEIS (SAtLE+GulFB). The final action closure is about half as effective in reducing the discards of blue and white marlin. However, analysis on the impact of use of live bait in the Gulf of Mexico (see final action under Section 7.2) indicates that the relatively higher incidence of billfish discards in GulFB may be a function of fishing practice (i.e., using live bait), rather than an actual reflection of higher frequency of occurrence. Prohibiting live bait may equalize much of the benefits between the GulFB and DeSoto Canyon closures, particularly for sailfish. The reduction in discards of pelagic sharks and large coastal sharks are similar between the proposed and final action closures. When effort redistribution is modeled, the DeSoto Canyon-Charleston Bump/East Florida Coast closures are more effective in reducing the discards of swordfish than the SAtLE+GulFB closure, and slightly more effective in reducing discards of sailfish. Discards of pelagic sharks and large coastal sharks will be lower under the final action that noted in the preferred alternative in the proposed rule.

The Charleston Bump/East Florida Coast closure will increase sea turtle interaction with redistribution of effort, but to a lesser degree than the year-round closure of SAtLE selected as a preferred alternative in the DSEIS. As noted in Section 5.8, NMFS reinitiated consultation under Section 7 of the ESA due to exceeding sea turtle take levels for the pelagic longline fishery in 1999. The June 2000 draft BO indicated that the continued operation of the Atlantic pelagic longline fleet is likely to jeopardize the continued existence of loggerhead turtles. It is possible, pending additional analysis, that the final BO will also include a jeopardy finding for leatherback sea turtles. Therefore, any increase in turtle takes as a result of effort redistribution must be carefully considered. NMFS has initiated efforts to address the BO, including possible regulatory and non-regulatory actions.

The "turtles caught" component analyzed under both the no effort redistribution and effort redistribution models, is a combination of all species of turtles reported by pelagic longline fishermen in the logbooks and identified as either released uninjured, injured or killed. To further refine the effects of the final action, the two effort models were applied to logbook information for 1995 through 1998 for loggerhead and leatherback sea turtles reported as either release uninjured, injured or killed (Table 7.8 A and B). Of the 2792 turtles interacting with pelagic longline gear between 1995 through 1998, 2504 were either leatherbacks (n=719) or loggerheads (n=1785) turtles that were reported caught but not injured. The 7.13% increase in turtle interactions predicted by the effort redistribution model (Figure 7.3) would result in an increase of 190 leatherbacks and loggerhead released unharmed, with the remainder of the impact resulting in an increase of 4 turtles injured and only 1 turtle killed, at least based on logbook reports.

Table 7.8. Impact of final time/area closures on the number of loggerhead and leatherback turtles caught and release unharmed, injured or killed on pelagic longline sets made during 1995 through 1998.

A. Charleston Bump (February through April) and East Florida Coast (year-round)

	Turtles Caught But NOT Injured			Turtles Injured		Turtles Killed	
	Turtles Caught ²	Leather-backs	Logger-heads	Leather-backs	Logger-heads	Leather-backs	Logger-heads
Total Atlantic	2792	719	1785	3	35	10	3
No Effort Redistribution	-1.64%	-1.67%	-0.78%	0.0%	0.0%	0.0%	0.0%
Expected Change ¹	2746	707	1771	3	35	10	3
Effort Redistribution	7.13%	8.09%	7.43%	7.01%	10.78%	8.07%	17.15%
Expected Change	2991	777.2	1917.7	3.2	38.8	10.8	3.5

¹Expected Change means the predicted change in catch (takes) based on the no effort redistribution model or effort redistribution model. Positive values for the models indicate a predicted INCREASE in catch, while negative values are indicative of a predicted DECREASE in catch. All changes are based on Atlantic-wide levels.

²Turtles Caught correspond to values provided Figure 7.3.

B. De Soto Canyon, closed all year.

	Turtles Caught But NOT Injured			Turtles Injured		Turtles Killed	
	Turtles Caught ²	Leather-backs	Logger-heads	Leather-backs	Logger-heads	Leather-backs	Logger-heads
Total Atlantic	2792	719	1785	3	35	10	3
Total Gulf of Mexico	66	27	9	0	1	1	0
No Effort Redistribution	-0.29%	-0.56%	-0.06%	0.0%	-2.9%	0.0%	0.0%
Expected Change ¹	2784	715	1784	3	34	10	3
Effort Redistribution	0.0%	-0.1%	0.0%	0.0%	-2.8%	0.5%	0.0%
Expected Change	2784	718.3	1785	3	34	10	3

¹Expected Change means the predicted change in catch (takes) based on the no effort redistribution model or effort redistribution model. Positive values for the models indicate a predicted INCREASE in catch, while negative values are indicative of a predicted DECREASE in catch. All changes are based on Atlantic-wide levels.

²Turtles Caught correspond to values provided Figure 7.3.

Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources

The ex-vessel gross revenues of the pelagic longline fishery as a whole might decrease by over \$7.5 million if all the effort is not redistributed (Table 7.9), which is about half the effect anticipated under similar conditions for the preferred DSEIS alternative closure of areas GulfB+SatlE. However, if the redistribution does occur, the ex-vessel gross revenues of the fishery might increase by nearly \$3 million. The actual impact of this closure is probably somewhere between these two values. In general, businesses and communities in the center of any closed area are likely to suffer the greatest loss in gross revenues while those businesses and communities along the edges of the closed area might not notice any differences. Businesses and communities outside the closed area might notice increased benefits as effort is moved to the open areas. A more complete evaluation of the economic and social impacts of the final action is provided in Sections 8.0 and 9.0, respectively, of this document based on the most conservative assumption, from an economic standpoint, of no effort redistribution.

Table 7.9. Impact on fishermen that results from the projected change in ex-vessel gross revenue based on change in number of target species caught in 1997 (in millions of dollars) for closing the Charleston Bump and East Florida Coast areas.

Species	Change in Ex-Vessel Gross Revenues (millions of \$)	
	No Redistribution Model	Redistributed Effort Model
Swordfish	-4.64	-2.44
BAYS tunas	-2.35	5.61
Bluefin tuna	-0.01	0.02
Pelagic sharks	-0.09	0.05
Large Coastal Sharks	-0.19	-0.08
Dolphin	-0.35	-0.20
Wahoo	-0.04	0.03
Total	-7.67	2.97

Changes in the Distribution of Benefits and Costs

The economic impact of the final action closure on pelagic longline target species was estimated by multiplying the percent change in target catch predicted by the no redistribution and redistribution models by the total Atlantic annual catch of each species. The resultant values are summarized in Table 7.7. Negative numbers indicate fewer fish would be caught under this closure scenario, while positive numbers indicate more fish caught. Dealers outside closed areas are likely to benefit due to increased effort close to their locations. In contrast, dealers in close proximity to closed areas may be directly negatively impacted.

The dollar values in Table 7.9 represent the change in gross revenue only to fishermen. Under the redistribution model, it is likely that fishing costs would increase as well, thereby exacerbating any decrease in gross revenues. Localized increases in recreational success for billfish, tunas and swordfish are likely following reduction of pelagic longline effort in the closed areas. The analytical approach used in the FSEIS does not quantify the possible increase in recreational opportunities; therefore any potential increase in angler consumer surplus and net economic benefit cannot accurately be estimated. However, it is possible that concomitant increases in vessel manufacture and purchase, dock and fuel services, tackle and gear supplies, charters, as well as other businesses in support of the recreational fishing industry, could be experienced.

Summary

This alternative is the final action because it is effective at reducing undersized swordfish and sailfish bycatch while minimizing economic, social and community impacts, particularly on Gulf of Mexico fishermen, but also for fishermen and businesses located along the southeast U.S. Atlantic coast (because the Charleston Bump area will be open for nine months of the year). NMFS' objective is to optimize target catch while reducing bycatch and incidental catch. Under the effort redistribution model, the proposed rule would decrease discards of swordfish by 24% and sailfish by 13 %, while potentially increasing blue marlin discards by 1% and white marlin discards by 4%. The final time/area closures, in conjunction with the live bait prohibition (Section 7.2) would reduce swordfish discards by 31% and sailfish discards by 29%; blue marlin and white marlin discards could increase by 3% and 7% respectively. Target catches under the proposed agency action would reduce the number of swordfish kept by 10% and dolphin kept by 36%; landings of BAYS tunas would increase by 9%. The final action time/area closures in the DeSoto Canyon, East Florida Coast and Charleston Bump could reduce number of swordfish kept by 13% and dolphin kept by 18%, while BAYS tunas landings would increase by nearly 10%.

During the comment period for the proposed agency action, many comments were received regarding environmental justice issues, particularly for the Vietnamese American community in the Gulf of Mexico and the impact on the yellowfin tuna fishery with closure of the western Gulf. Comments from residents of SC noted a similar issue with minority workers in commercial industries that support the pelagic longline fishery in that area. NMFS has minimized the economic effects of the proposed western Gulf of Mexico closure that was specifically established to reduce billfish bycatch, by prohibiting use of live bait by pelagic longline vessels instead. Application of this gear restriction appears to be as effective in reducing sailfish discards as the western Gulf closure, and is approximately half as effective in reducing marlin discards. In consideration of the magnitude of U.S. billfish discards relative to Atlantic-wide levels and the extent of the economic impacts associated with the proposed Gulf closure, modifying fishing practices is a viable alternative that effectively addresses the objectives of the agency actions by reducing billfish bycatch, to the extent practicable, while allowing fishing to continue in the western Gulf of Mexico (see Section 7.2).

The final action also resulted in the smallest predicted increase in sea turtle interactions (7 percent)

when effort is redistributed, of all the time/area alternatives considered. It should be noted, however, that turtle bycatch rates may be over-estimated by the effort redistribution model because estimation of catch-per-unit-effort assumes species are randomly distributed in the remaining open areas. The results could be skewed if species are concentrated in one area such sea turtles in the Grand Banks, rather than randomly distributed over the entire open area. Further, nearly 90 percent of all sea turtle interactions with pelagic longline gear result in release of the animal with no damage, based on information provided in the pelagic logbooks.

SECTION 8 THROUGH SECTION 11 AND APPENDICES A THROUGH C-4
AND APPENDICES D AND E OMITTED INTENTIONALLY

Dolphin-Wahoo Pelagic Longline Fishery Analysis

In the proposed rule on reducing bycatch mortality in the pelagic longline fishery, NMFS indicated a concern that the pelagic longline fishery targeting dolphin may have similar bycatch rates to those sets targeting swordfish and BAYS tunas. Consequently, NMFS proposed that HMS-permitted vessels be prohibited from setting pelagic longline gear in the closed area, regardless of target species. Given the jurisdictional issues, NMFS requested that the respective Fishery Management Councils consider the potential bycatch issues presented by pelagic longlines set in the closed area to target species managed under Council FMPs.

NMFS examined logbook reports from 1998 for all sets made in the area proposed for year round closure (SatLE: Key West, FL to Wilmington Beach, NC). Because logbook reports do not specifically indicate which sets targeted dolphin, NMFS separated all sets into those targeting swordfish/tunas/sharks and those listing a target as "other". It was presumed that sets listing a target as "other" are predominantly targeting dolphin and this was reflected in the nearly 10 fold higher catch per set of dolphin: 1.7 vs 15.1 dolphin kept per set. Preliminary information from the pelagic logbook database that addresses bycatch by pelagic longline gear set to target dolphin (mahi) off the southeast U.S. is presented in Table C-4.

Note that sets listing "other" as a target represent about 13% of the total effort in the area. All else equal, catch and bycatch rates would be approximately the same share of the totals as that of effort (i.e., 13%). This expectation is generally reflected in the data with respect to swordfish kept (~8/set), BAYS tunas kept (~0.5/set), and billfish discards (~0.2/set). However, swordfish and bluefin tuna discards are lower than would otherwise be expected, while dolphin and wahoo kept and BAYS tunas discards are higher than would be expected. These differences in catch rates may be related to fishing area, time of day/season, and/or gear modifications. Nonetheless, given the pelagic logbook reports, bycatch of billfish, sharks and BAYS tunas seems to be a concern in the dolphin fishery.

Further specific information on catch occurring when pelagic longlines are set to target dolphin would be needed to confirm or refute the bycatch concerns. In the interim, to facilitate enforcement and to take a precautionary approach, NMFS has decided that HMS-permitted vessels should be prohibited from setting all pelagic longline gear in the closed areas, regardless of target species. It is possible that an operator of an HMS-permitted vessel who wishes to target dolphin could apply for an exempted fishing permit (EFP). If EFPs are issued, the data collected (e.g., logbook or observer reports) could be used to determine if a dolphin fishery could be undertaken that would be consistent with the bycatch reduction objectives of the HMS FMP. However, such authorization for EFPs would have to be considered in consultation with the Councils having management authority for dolphin.

Table C-4. Pelagic logbook reports of effort, catch and bycatch in SATIE closed area during 1998.

	Target				Percent
	Sword/Tunas/Shark		Other Species		Targeting
	Number	# / sets	Number	# / sets	Other Species
Sets	2,140		320		13.0%
Hooks	841,981	393.4	153,426	479.5	15.4%
Swordfish kept	18,757	8.8	2,678	8.4	12.5%
Swordfish discarded	9,105	4.3	470	1.5	4.9%
Bluefin tuna kept	5	0.0	0		
Bluefin tuna discarded	3	0.0	0		
BAYS tunas kept	1,132	0.5	182	0.6	13.9%
BAYS tunas discarded	91	0.0	52	0.2	36.4%
Blue marlin discarded	174	0.1	13	0.0	7.0%
Sailfish discarded	207	0.1	28	0.1	11.9%
Spearfish discarded	21	0.0	4	0.0	16.0%
White marlin discarded	90	0.0	15	0.0	14.3%
Pelagic sharks kept	296	0.1	62	0.2	17.3%
Pelagic Sharks discarded	1,038	0.5	288	0.9	21.7%
Lg coastal sharks kept	5,825	2.7	194	0.6	3.2%
Lg coastal sharks discarded	2,649	1.2	614	1.9	18.8%
Turtles caught	9	0.0	0		
Turtles injured	0	0			
Turtles killed	0	0			
Dolphin kept	3,636	1.7	4,834	15.1	57.1%
Dolphin discarded	20	0.0	7	0.0	25.9%
Wahoo kept	124	0.1	109	0.3	46.8%
Wahoo discarded	2	0.0	0		

* Data are preliminary and subject to change. Logbook database queried on January 27, 2000.

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Appendix D. HMS Final Rule for the Regulatory Amendment to the Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan to Address Reduction of Bycatch and Incidental Catch in the Atlantic Pelagic Longline Fishery (NMFS, 2000) and Technical Amendment to the Final Rule (NMFS, 2001).



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Part III

Department of Commerce

National Oceanic and Atmospheric
Administration

50 CFR Part 635

Atlantic Highly Migratory Species; Pelagic
Longline Management; Final Rule

DEPARTMENT OF COMMERCE**National Oceanic and Atmospheric Administration****50 CFR Part 635****[Docket No. 991210332-0212-02; I.D. 110499B]****RIN 0648-AM79****Atlantic Highly Migratory Species; Pelagic Longline Management****AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.**ACTION:** Final rule.

SUMMARY: NMFS issues final regulations to prohibit pelagic longline fishing at certain times and in certain areas within the Exclusive Economic Zone of the Atlantic Ocean off the coast of the Southeastern United States and in the Gulf of Mexico, and to prohibit the use of live bait when deploying pelagic longline gear in the Gulf of Mexico. This action is necessary to reduce bycatch and incidental catch of overfished and protected species by pelagic longline fishermen who target highly migratory species (HMS).

DATES: This final rule is effective September 1, 2000.

ADDRESSES: For copies of the Final Supplemental Environmental Impact Statement/Regulatory Impact Review/Final Regulatory Flexibility Analysis (FSEIS/RIR/FRFA), contact Steve Meyers at 301-713-2347 or write to Rebecca Lent, Chief, HMS Division (SF/1), Office of Sustainable Fisheries, NMFS, 1315 East-West Highway, Silver Spring, MD 20910.

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steve.meyers@noaa.gov; or Buck Sutter at 727-570-5447, fax 727-570-5364, e-mail buck.sutter@noaa.gov.

SUPPLEMENTARY INFORMATION: The Atlantic swordfish and tuna fisheries are managed under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the Atlantic Tunas Convention Act (ATCA). The Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (HMS FMP) is implemented by regulations at 50 CFR part 635.

Pelagic Longline Fishery

Pelagic longline gear is the dominant commercial fishing gear used by U.S. fishermen in the Atlantic Ocean to target highly migratory species. The gear

consists of a mainline, often many miles in length, suspended in the water column by floats and from which baited hooks are attached on leaders (gangions). Though not completely selective, longline gear can be modified (e.g., gear configuration, hook depth, timing of sets) to target preferentially yellowfin tuna, bigeye tuna, or swordfish.

Observer data and vessel logbooks indicate that pelagic longline fishing for Atlantic swordfish and tunas results in catch of non-target finfish species such as bluefin tuna, billfish, and undersized swordfish, and of protected species, including threatened and endangered sea turtles. Also, this fishing gear incidentally hooks marine mammals and sea birds during tuna and swordfish operations. The bycatch of animals that are hooked but not retained due to economic or regulatory factors contributes to overall fishing mortality. Such bycatch mortality may significantly impair rebuilding of overfished finfish stocks or the recovery of protected species.

Proposed Bycatch Reduction Strategy

Atlantic blue marlin, white marlin, sailfish, bluefin tuna, and swordfish are overfished. In the HMS FMP and Amendment 1 to the Atlantic Billfish FMP (Billfish FMP Amendment), NMFS adopted a strategy for rebuilding these stocks through international cooperation at the International Commission for the Conservation of Atlantic Tunas (ICCAT). This strategy primarily involves reducing fishing mortality through the negotiation of country-specific catch quotas according to rebuilding schedules. However, the contribution of bycatch to total fishing mortality and the fact that ICCAT catch quotas for some species require that countries account for dead discards must be considered in the HMS fisheries. The swordfish rebuilding plan that was adopted by ICCAT at its 1999 meeting provides added incentive for the United States to reduce swordfish discards.

In addition to ICCAT stock rebuilding efforts, several other applicable laws require that NMFS address bycatch issues in the HMS fisheries. These include the Magnuson-Stevens Act, the Marine Mammal Protection Act (MMPA), and the Endangered Species Act (ESA). Magnuson-Stevens Act national standard 9 for fishery management plans requires U.S. action to minimize bycatch and bycatch mortality to the extent practicable.

Under the MMPA, the Atlantic pelagic longline fishery has been listed as a Category I fishery due to the frequency of incidental mortality and

serious injury to marine mammals. The Atlantic Offshore Cetacean Take Reduction Team was formed in May 1996 to address protected species bycatch in the Atlantic pelagic fisheries. A take reduction plan, submitted to NMFS in November, 1996, that contained measures to address the bycatch of strategic stocks of marine mammals, noted that additional reductions in takes of marine mammals could occur with closures of certain fishing areas during times of high interaction rates.

Finally, under the ESA, NMFS is required to address fishery-related take of sea turtles that are considered threatened or endangered. Although most turtles are released alive, NMFS remains concerned about serious injuries of turtles hooked on pelagic longline gear. To the extent that turtle interactions occur at higher rates in certain fishing areas at particular times, time-area closures for pelagic longline fishing could affect turtle takes. An area closure to address swordfish discards could also help reduce sea turtle interactions if these animals tend to occur in the same ocean areas at the same time. Conversely, if sea turtle interactions are relatively higher in areas that remain open, fishing effort displaced from areas closed to protect juvenile swordfish could lead to increased turtle takes.

In the final HMS FMP and Billfish FMP Amendment, NMFS stated that a comprehensive approach to time-area closures would be undertaken as part of a bycatch reduction strategy after further analysis of the data and consultation with the HMS and Billfish Advisory Panels (APs). NMFS held a combined meeting of the HMS and Billfish APs on June 10-11, 1999, to discuss possible alternatives for a proposed rule under the framework provisions of the HMS FMP. The AP members were generally supportive of the time-area management strategy, provided several comments on temporal and/or spatial components that NMFS should consider further in its analyses, and requested that NMFS develop a written document outlining all analytical methods and results of the time-area evaluation. The APs' comments and suggestions were included in the development of a draft Technical Memorandum, which was made available to the public on November 2, 1999 (64 FR 59162).

Subsequent to the release of the Technical Memorandum, NMFS considered three alternative actions to reduce bycatch and/or bycatch mortality in the Atlantic HMS pelagic longline fishery: status quo, gear modifications that would decrease hook-ups and/or

increase survival of bycatch species, and the prohibition of longline fishing in areas where rates of bycatch or incidental catch are higher. NMFS considered gear modifications beyond those examined previously during development of the HMS FMP. NMFS also considered a broad range of closures, both in terms of area and time. A proposed rule was published December 15, 1999 (64 FR 69982), for which alternatives were identified and analyzed in a draft Supplemental Environmental Impact Statement (64 FR 73550, December 30, 1999). The proposed rule included closed areas for pelagic longline gear in the western Gulf of Mexico and off the southeast coast of the United States.

During the comment period on the proposed rule, NMFS received comment on many issues related to the proposed time/area closures. In particular, commenters noted that the proposed closure in the western Gulf of Mexico would not adequately address juvenile swordfish bycatch in the DeSoto Canyon area of the eastern portion of the Gulf. Additionally, commenters noted the significant economic impacts associated with large scale area closures in that vessel operators and shoreside support services would need considerable time for adjustment and relocation. Given these comments, NMFS analyzed the potential impacts of an additional closed area in the DeSoto Canyon. Subsequently, NMFS published supplementary information regarding the potential impacts of closing the DeSoto Canyon Area together with a revised summary of the IRFA prepared for the proposed rule (65 FR 24440, April 26, 2000). The comment period for the proposed rule was reopened through May 12, 2000, and NMFS specifically requested comments on the extent to which delayed effectiveness could mitigate the economic impacts of area closures.

ESA Consultation

On November 19, 1999, NMFS reinitiated consultation under section 7 of the ESA based on preliminary reports that observed incidental take of loggerhead sea turtles by the Atlantic pelagic longline fishery during 1999 had exceeded levels anticipated in the Incidental Take Statement (ITS) previously issued for the HMS FMP. Additionally, the consultation included the pelagic longline management rulemaking that was in preparation, as it was recognized that the time/area closures, if implemented, could affect the overall interaction rates with sea turtles. In a Biological Opinion issued on June 30, 2000 (BO), NMFS concluded

that operation of the pelagic longline fishery was likely to jeopardize the continued existence of loggerhead and leatherback sea turtles. The BO identified the Reasonable and Prudent Alternatives (RPAs) necessary to avoid jeopardy and listed the Reasonable and Prudent Measures (RPMs) and Terms and Conditions (TCs) necessary to authorize continued take as part of a revised ITS. While the implications of the BO are discussed in this final rule, NMFS will undertake additional rulemaking and non-regulatory actions as required to implement the additional management measures required under the BO.

Response to Comments

NMFS received several hundred comments and several thousand form letters during the 2 comment periods, 13 public hearings, and 2 joint AP meetings of this rulemaking. Following are summaries of the comments together with NMFS' responses.

General

Comment 1: There is no conservation benefit from the proposed closures except for small swordfish; therefore, the proposed time/area closures will probably have an imperceptible effect on rebuilding overfished HMS.

Response: NMFS disagrees. Depending on the amount of redistribution of effort under the proposed closed areas, other species, such as sailfish and large coastal sharks, may benefit from these closures. Under the no-effort redistribution model, billfish discards are reduced by 19 to 43 percent, although, as discussed in the FSEIS, the actual benefit of these time/area closures is likely somewhere between the extremes predicted by the effort redistribution models. Further, prohibiting the use of live bait will provide a 10- to 46-percent reduction in billfish discards in the Gulf of Mexico. National standard 9 of the Magnuson-Stevens Act requires that FMPs reduce bycatch to the extent practicable. Although it was not a stated objective of the final rule to rebuild overfished stocks through time/area closures or gear modifications, some benefit to rebuilding may also be experienced to the degree that mortality rates will be reduced for juveniles, pre-adults, and reproductive fish. Also, to the extent that the United States can use the domestic bycatch reduction program, including time/area closures and gear modifications, to convince other ICCAT member nations that bycatch should be minimized, these actions may have a significant impact on Atlantic-wide rebuilding of overfished HMS stocks.

Comment 2: NMFS is already past the deadline for a rebuilding program for overfished HMS that includes bycatch reduction measures.

Response: NMFS disagrees. The HMS FMP and the Billfish FMP Amendment include rebuilding plans that meet Magnuson-Stevens Act guidelines. The swordfish rebuilding program recently adopted by ICCAT is based in large part on the rebuilding plan outlined in the HMS FMP. Similarly, the rebuilding plans for blue and white marlin emphasize the importance of international efforts to reduce bycatch and bycatch mortality. NMFS implemented bycatch reduction measures in the HMS FMP, including limited access for swordfish and shark fisheries, time/area closure for pelagic longline gear to reduce bluefin tuna dead discards, limiting the length of mainline for longline fishermen, and other measures summarized in the HMS FMP. The Billfish FMP Amendment also outlined a bycatch reduction strategy. NMFS expects that additional measures will continue to be implemented for all HMS fisheries, including educational workshops that share results of recent research on gear modifications. Finally, as a result of the jeopardy finding in the BO, NMFS will initiate implementation of the requirements of the BO via additional rulemaking and other non-regulatory means.

Comment 3: NMFS should extend the VMS implementation deadline past June 1, 2000.

Response: NMFS agrees. On April 19, 2000 (65 FR 20918), NMFS extended the effective date until September 1, 2000. This will provide adequate time (2 months) to ensure that all systems are fully functional prior to the implementation of the time/area closures. Also, implementation of the measures in the BO may require a time/area closure and/or gear setting restrictions to be enforced by VMS.

Comment 4: As the swordfish stocks continue to rebuild, the United States may need more U.S. boats to harvest the swordfish quota.

Response: NMFS disagrees. The final regulations implementing the HMS FMP (May 28, 1999; 64 FR 29090), NMFS established a limited access program for Atlantic swordfish, Atlantic shark, and the pelagic longline sector of the Atlantic tuna fisheries. A description of the qualifying requirements for a directed or incidental limited access permit is contained in Chapter 4 of the HMS FMP. Using a multi-tiered process based on participation, approximately 450 limited access swordfish permits (directed and incidental) were awarded.

Subsequent examination of fishing activity by these vessels in preparation of the proposed and final rule indicates that a significant portion did not report any HMS landings in either 1997 (331 vessels reported HMS landings) or 1998 (208 vessels reported HMS landings). Currently, the North Atlantic swordfish stock is estimated to be at 65 percent of the level needed to support maximum sustainable yield (MSY). When the stock attains the level consistent with MSY, it is likely that the number of U.S.-flagged vessels with directed or incidental swordfish permits will be sufficient to handle any potential increase in the U.S. swordfish quota.

Comment 5: NMFS should be concerned about small sources of mortality that may exacerbate overfishing and slow rebuilding.

Response: NMFS agrees and is concerned about all sources of mortality on HMS stocks. NMFS is committed to work through available international fora to rebuild overfished HMS stocks, even when U.S. fishing is responsible for only a small source of the total Atlantic-wide mortality. The rebuilding plans provided in the Billfish FMP Amendment are indicative of this commitment. Further, the Agency is required by the Magnuson-Stevens Act to take appropriate conservation actions, while considering the social and economic impacts on fishermen and fishing communities, and as such must consider management actions that meet the national standard guidelines.

Comment 6: NMFS should increase outreach efforts to inform the public of the need for management of HMS resources.

Response: NMFS agrees but is currently restricted from increasing outreach efforts by competing demands for funding (e.g., funds for observers, science). Note that the NMFS Highly Migratory Species Management Division posts current events and useful documents on the website www.nmfs.noaa.gov/sfa/hmspg.html. NMFS also produces informational brochures on current fishing regulations and mailouts, and NMFS uses a fax network for distribution of information. NMFS scientists are also participating in periodic outreach programs to share information on life history of billfish, sharks and tunas, as well as sharing information on methods that will enhance survival of released fish. An information hotline has also been established that summarizes current fisheries regulations as they apply to HMS. The hotline can be accessed by calling toll-free at 1-800-894-5528. Additional outreach efforts will be

implemented as funding becomes available.

Comment 7: The proposed closed areas will result in an increase in swordfish imports into the United States; this would deny U.S. seafood consumers access to fresh, quality-controlled fish.

Response: NMFS does not anticipate that the U.S. fleet will be unable to meet its quota as a result of this final rule. Therefore, it is unlikely that imports will increase as a result of closed areas, although imports may increase for other unrelated reasons. NMFS does regulate the swordfish market other than to prohibit the import of undersized Atlantic swordfish into the U.S., which is monitored through the Certificate of Eligibility program. NMFS does not anticipate that this rule would affect the availability of high-quality, inspected seafood products provided to citizens of the United States by U.S. commercial fishermen. Imports of fishery products into the United States are also subject to the same hazard analysis and critical control point (HACCP) guidelines as are domestic landings.

Comment 8: The proposed closed areas are not equitable for constituents in different states.

Response: As required by national standard 2 of the Magnuson-Stevens Act, NMFS utilized the best available scientific information to develop the proposed rule and the final action. NMFS used logbooks, observer programs, and various scientific studies to identify distributional patterns of seasonal abundance, by species, and areas of overlap between various HMS, protected and endangered species, as defined by concentrations of bycatch and incidental catch from pelagic longline gear in the U.S. EEZ. Therefore, in large part, the biology of the species dictated the locations of the closures. In the selection of the final actions, international obligations and the national standards were considered, including the issue of equity, as required by national standard 4. While the final closed areas may have larger impacts on fishermen who fish in those areas, such impacts are not inconsistent with national standard 4.

Comment 9: NMFS is ignoring sea bird bycatch by the recreational fishermen who troll for HMS.

Response: NMFS disagrees that it is ignoring sea bird bycatch. NMFS has no data indicating that sea birds are caught and discarded in the recreational fishery for HMS. NMFS is currently implementing a logbook and a voluntary observer program for charter/headboats involved with HMS fisheries. This program will provide additional

information on recreational fishing, including any possible interactions with seabirds or other protected or endangered species. If the data collected indicate that a sea bird bycatch problem exists in the U.S. recreational troll fisheries, NMFS will take appropriate action.

Comment 10: NMFS should quantify bycatch and bycatch mortality in the recreational fishery.

Response: NMFS agrees that quantifying bycatch and bycatch mortality in recreational fisheries is important and has collected data used to quantify bycatch of large pelagics in the recreational fishery. Such data are reported in the U.S. National Report prepared each year by NMFS for submission to ICCAT. The Billfish FMP Amendment established a catch-and-release fishery management program for the recreational Atlantic billfish fishery; therefore, all billfish released alive, regardless of size, by recreational anglers are not considered as bycatch. However, the mortality associated with the capture-and-release event is an important component to quantify for population assessment. NMFS currently collects data on the number of billfish retained and released at selected tournaments. NMFS has funded studies to quantify the bycatch mortality in bluefin tuna and billfish recreational fisheries, and NMFS scientists have recently reported on the use of circle hooks to reduce release mortality for the recreational billfish fishery. NMFS encourages fishermen to handle and release HMS in a manner that maximizes their chances of survival.

Comment 11: NMFS should re-establish the Second Harvest Program for swordfish whereby undersized swordfish are fed to the hungry instead of being discarded as bycatch.

Response: The specific regulations for the swordfish donation program were eliminated when the HMS regulations were consolidated in implementing the final HMS FMP and Billfish FMP Amendment (May 29, 1999; 64 FR 29090). During the consolidation process, the swordfish donation program regulations were evaluated under the President's Regulatory Reinvention Initiative. Given the low level of participation in the program at the time and the anticipated reduction in dead discards of undersized swordfish as the U.S. moved to adopt the alternative minimum size, it was determined that potential scale of operations did not require extensive regulatory text. However, under the current consolidated regulations, a fishermen could apply for an Exempted Fishing Permit (EFP) to authorize the

donation of certain fish that could not otherwise be retained (e.g., swordfish in excess of the bycatch limits in effect for the particular vessel). Thus, the regulations still provide a mechanism for a donation program.

Comment 12: NMFS regulations force pelagic longline fishermen to discard swordfish, thus increasing bycatch in this fishery. NMFS should have a higher minimum size with a tolerance for undersized fish to reduce bycatch.

Response: Swordfish caught below the minimum size are regulatory discards and, as such, are considered bycatch. The minimum size limit was established to create an incentive for fishermen to avoid areas of undersized swordfish, though this was found to be less successful than anticipated. NMFS discontinued the use of a higher minimum size with a 15-percent tolerance for smaller fish because of concerns about the difficulty in enforcing such a measure. NMFS proposed a lower minimum size with no tolerance, and industry participants largely supported this decrease, stating that most of the fish landed under the tolerance provisions were just under the higher minimum size. In the Spring of 1999, the ICCAT Advisory Committee recommended that NMFS evaluate the efficacy of the swordfish minimum size limit and reconsider eliminating that size limit if warranted. Pending the outcome of that evaluation, ICCAT is expressly considering discards in the swordfish catch allocation scheme. Under the 1999 ICCAT recommendation, total North Atlantic discards of undersized swordfish are subject to an allowance of 400 mt Atlantic-wide for the 2000 fishing season; the U.S. receives 80 percent of this dead discard allowance (320 mt). The United States is obligated by international agreement to address swordfish discards. The time/area closures defined in the final rule will significantly reduce swordfish discards by U.S. pelagic longline vessels. Although some small swordfish will still be encountered under time/area management, the overall proportion of the catch that is discarded will be reduced and may, in fact, provide an opportunity to consider alternatives to minimum sizes in the international management of Atlantic swordfish.

Comment 13: The proposed closed areas are expected to increase the catch of mako, thresher, and blue sharks. The pelagic shark stocks will not be able to withstand the possible increase in pelagic shark mortality (landings and discards) associated with pelagic longline effort redistribution.

Response: Although the status of the pelagic sharks stock is currently designated as unknown, NMFS disagrees that the final rule will have a significant adverse impact on pelagic shark mortality. However, this does not mean that NMFS is not concerned about the status of these stocks. In fact, the HMS FMP established a blue shark quota, including dead discards from pelagic longline gear, that effectively sets an upper limit to the magnitude of impacts from displaced effort. In analyzing the impacts of the final closed areas, NMFS predicts only a 4-percent increase in pelagic shark landings and estimated discard rates increase by 8 percent under the effort redistribution model, which may overestimate impacts on bycatch and target catch. NMFS will closely monitor all pelagic shark landings through logbook and observer programs to follow changes in landing patterns resulting from effort redistribution.

Comment 14: The proposed time/area closures will reduce gear conflicts between the growing recreational HMS fisheries and commercial fishing communities, but in some areas, particularly the eastern Gulf of Mexico and Mid-Atlantic Bight, conflicts could potentially increase.

Response: NMFS previously identified gear conflicts between recreational and commercial entities in the 1988 Atlantic Billfish FMP and in the 1999 Amendment to that FMP. NMFS agrees that conflicts between recreational and commercial fishing groups could escalate in areas that remain open as a result of pelagic longline effort redistribution. Mitigating possible user conflicts was one of several reasons that temporal and spatial components of the proposed action were refined in the final action and, in the case of the western Gulf of Mexico, replaced by a live bait prohibition. Any management measure leading to a reduction in bycatch of billfish from commercial fishing gear may lead to localized increases in angler success and resultant economic benefits to associated U.S. recreational industries.

Comment 15: NMFS should consider implementing Individual Transferable Quotas (ITQs) in the future as a bycatch reduction measure, particularly for bluefin tuna in the longline fishery.

Response: Implementation of an ITQ scheme, with the sole or even partial purpose of reducing discards, could be considered and would require extensive detailed analysis before proceeding. However, NMFS is prohibited by the Magnuson-Stevens Act from implementing new ITQ programs at this

time. The HMS FMP specifically addressed the bycatch of bluefin tuna by the pelagic longline fishery through implementation of a time/area closure during June off the Mid-Atlantic Bight. Initial results of the efficacy of the first closure (June 1999) are preliminary and do not indicate that the anticipated reductions were fully achieved. NMFS is currently reviewing whether the results are due to (1) a limited time frame for outreach (the final rule was published on May 28, 1999, with an effective date of June 1, 1999, for the bluefin tuna pelagic longline closure); (2) enforcement issues (VMS implementation was delayed until September 1, 2000); or, (3) inter-annual variation in the areas of BFT interaction (increased discards occurred outside of the closed area).

Comment 16: Large closed areas will pose significant enforcement challenges to U.S. Coast Guard (USCG) since the areas identified for closure in the proposed rule are not routinely patrolled by cutters. (This comment received from the USCG was followed up by a comment that supports the use of VMS to enforce closed areas.)

Response: NMFS recognizes the need for effective enforcement of these closed areas and, as such, supports the use of VMS, which will become effective for all pelagic longline vessels on September 1, 2000 (65 FR 20918; April 19, 2000). USCG resources will continue to be utilized, as that Agency is capable of confirming a vessel's location and whether it is fishing in the closed area. NMFS has entered into a cooperative agreement with the USCG to assist in the monitoring of fishing vessels at USCG locations.

Comment 17: NMFS should define the closed area by latitude and longitude in the regulatory text, including the designation for the U.S. EEZ.

Response: Except for a small portion of the East Florida Coast area, NMFS provides latitude and longitude coordinates for the boundaries to the closed areas in the regulatory text of this final rule. Given the curvature of the EEZ boundary between the U.S. and the Bahamas, it would be too complicated to express that segment of the boundary in latitude and longitude coordinates. NMFS notes that the EEZ boundary is plotted on most NOAA nautical charts and that vessel operators fishing that area must be familiar with the EEZ boundary in any case, as they are not authorized to fish commercially in the Bahamas.

Comment 18: NMFS should take these proposed closed areas to ICCAT and encourage international closed areas.

Response: NMFS supports consideration of closed areas and gear modifications to reduce undersized swordfish catch and fishing mortality and to protect spawning and/or nursery areas for swordfish and billfish on an Atlantic-wide basis, as discussed in the HMS FMP and Billfish FMP Amendment. In 1999, ICCAT adopted a U.S.-sponsored resolution for the development of possible international time/area closures (and gear modifications), and the Standing Committee for Research and Statistics (SCRS) is scheduled to provide a report on this topic at the ICCAT meeting in 2002. The final rule will be included in the U.S. National Report that will be submitted to ICCAT in October, 2000.

Comment 19: NMFS should ban pelagic longline gear or, at least, ban the use of this gear inside the U.S. EEZ.

Response: NMFS disagrees. Banning pelagic longline gear in the U.S. EEZ is not necessary to protect highly migratory species. Bycatch can be addressed through time/area closures, education, and gear modifications. Requiring all vessels using pelagic longline gear to fish only outside the 200 mile limit may also be inconsistent with consideration of safety issues as required under national standard 10.

Comment 20: Closures are not necessary; swordfish are rebuilding.

Response: NMFS agrees that the North Atlantic swordfish stock may have stabilized and that an international rebuilding program is in place. To the extent that the time/area closures will reduce bycatch and bycatch mortality of undersized swordfish, pre-adults, and spawning fish, the closures will enhance stock rebuilding. Furthermore, NMFS is required by an ICCAT recommendation and under national standard 9 to minimize bycatch, to the extent practicable. Providing protection of small swordfish and reproducing fish through time/area closures is particularly critical as stocks begin to rebuild. The United States is allocated 29 percent of the north Atlantic swordfish quota (1997 through 1999), and approximately 80 percent of the reported dead discards. Under the 1999 ICCAT recommendation, the total North Atlantic dead discard allowance for the 2000 fishing season is 400 mt; the U.S. receives 80 percent of the North Atlantic dead discard allowance (320 mt). The dead discard allowance for the United States is reduced to 240 mt in 2001, 160 mt in 2002, and will be phased out by 2004, with any overage of the discard allowance coming off the following year's quota. A total of 443 mt of swordfish were reported discarded by U.S. fishermen in the North Atlantic

during 1998. Under the time/area strategy of the final rule, the no effort redistribution model predicts a 41.5-percent reduction in discards; under the effort redistribution model, discards are reduced by 31.4 percent. The closures could potentially reduce discards from 1998 levels to 259 mt under the no-effort redistribution model and to 304 mt under the effort redistribution model, thereby meeting at least the year 2000 discard allocation levels without affecting the subsequent year's quota.

Comment 21: NMFS should increase observer coverage of all components of HMS fisheries, including the pelagic longline fishery.

Response: NMFS agrees that it would be beneficial to increase observer coverage to document bycatch in all HMS fishing sectors. Observer coverage of the pelagic longline averaged between 4 and 5 percent between 1992 through 1998; a total of 2.9 percent of pelagic longline sets were observed during 1998. However, given current fiscal constraints, NMFS will not likely be able to significantly increase observer coverage in the pelagic longline fishery. NMFS will investigate additional funding mechanisms. Depending on funding, NMFS may implement an initial phase of the HMS charter/headboat and voluntary observer program in the summer of 2000 that will provide additional bycatch information from recreational fisheries.

Comment 22: NMFS should develop a comprehensive bycatch strategy, including specific targets for bycatch reduction.

Response: NMFS disagrees that setting fixed bycatch targets is necessary; in fact, such targets may be counterproductive. The multi-species approach followed in the development of the proposed and final action to reduce bycatch, bycatch mortality, and incidental catch precludes setting target reduction for specific species without considering the impact on the remaining portion of the catch composition. For example, if the time/area closures were simply based on reducing swordfish discards by a set percentage, a concomitant increase in bycatch of other species could occur, or target catches could be reduced more than necessary to achieve national standard 9 mandates. NMFS agrees that a comprehensive bycatch strategy is necessary and has outlined a plan that incorporates data collection, analysis, and measures that minimize bycatch, to the extent practicable. This strategy is outlined in the HMS FMP and the Billfish FMP Amendment.

Comment 23: NMFS should conduct educational workshops.

Response: NMFS supports the use of educational workshops to disseminate information on current research regarding bycatch reduction and to provide a forum through which fishermen can share bycatch reduction techniques with each other. NMFS scientists periodically hold seminars for fishermen to discuss the benefits of circle hooks and other handling techniques in the recreational billfish fishery. NMFS will seek input from representatives of fishing organizations and from the AP members regarding opportunities for workshops. Depending upon available funding and staff, NMFS will hold educational workshops to examine bycatch reduction activities in HMS fisheries, both for recreational and commercial fishermen.

Comment 24: NMFS needs to be able to respond quickly to results of monitoring and evaluation of closed areas. NMFS should develop a framework process for adjusting closed areas, if necessary, in a timely manner.

Response: NMFS agrees that a quick response to shifting fishing effort patterns is necessary. NMFS is currently able to adjust or develop new closed areas through the framework process (proposed and final rules, including public comment period) without amending the HMS FMP in the event that closed areas need to be altered to maximize the benefits to the nation. However, it will take time to collect and analyze the appropriate information, including data from the mandatory logbooks, observer program, and VMS.

Comment 25: NMFS should reduce effort in the longline fishery, not just reduce bycatch.

Response: The intent of this rulemaking is not to reduce effort in the fishery, but to reduce bycatch while minimizing the reduction of target catch by shifting effort away from areas with high bycatch and incidental catch. NMFS agrees that under a quota system, a time/area closure scheme will not necessarily reduce effort, although some vessel operators may choose to discontinue fishing due to economic or social factors. The use of time/area closures and gear restrictions (prohibition of live bait) was deemed by NMFS to be the best available management tool to reduce current levels of bycatch by the pelagic longline fishery, as required by national standard 9.

Comment 26: NMFS should consider additional actions to address the impact of the increase in sea turtle interactions resulting from pelagic longline effort redistribution.

Response: NMFS agrees that sea turtle interactions with pelagic longline gear

must be minimized as required by the ESA for listed species. On November 19, 1999, NMFS reinitiated consultation with NMFS' Office of Protected Resources based on preliminary information on the 1999 take levels by the pelagic longline fishery. The BO issued on June 30, 2000 concluded that the continuation of the pelagic longline fishery could jeopardize the continued existence of loggerhead and leatherback sea turtles. The final time/area closures along the southeastern U.S. Atlantic coast were temporally and spatially reconfigured to mitigate, to the extent practicable, the impact of effort redistribution on sea turtle interactions. Bycatch rates, particularly for sea turtles, may be over-estimated by the effort redistribution model because the model estimated bycatch rates by assuming random or constant catch-per-unit-effort in all remaining open areas. This estimation procedure could skew results for certain species if those species are concentrated in certain areas (such as sea turtles in the Grand Banks), instead of being randomly distributed over the entire open area. Fishing activities will be monitored using VMS, as well as through logbooks and on-board observers, to determine impacts of actual effort redistribution, which may require further Agency action to address increased turtle takes. NMFS is initiating efforts to address the requirements of the BO, including possible regulatory and non-regulatory actions.

Comment 27: NMFS is proceeding with the use of time/area management strategies only because of litigation filed against NMFS by various environmental groups following publication of the final rules implementing the HMS FMP.

Response: NMFS disagrees. During public hearings held during the Fall of 1998 as part of the scoping process used to develop management alternatives for the draft HMS FMP and the Billfish FMP Amendment, NMFS received many comments regarding the utility of time/area closures to reduce bycatch in various HMS fisheries, including pelagic longline gear, and their use in protecting essential fish habitat (e.g., spawning and nursery grounds). The draft HMS FMP included a closure of a portion of the Florida Straits to reduce swordfish discards. Comments on the proposed action indicated that the area was spatially and temporally too limited to accomplish any significant reduction in bycatch, and, consequently, the area was not included as part of the final action. However, the HMS FMP clearly stated that, following publication of a final rule, an evaluation of wide-ranging time/area closures would be completed

and implemented, if warranted. NMFS honored that commitment through the preparation of the Draft Technical Memorandum and the proposed and final rules, establishing both time/area and gear modifications to reduce bycatch by the U.S. Atlantic HMS pelagic longline fishery.

Comment 28: The comment period for the DeSoto Canyon area closure alternative is too short. Additional time must be provided to allow those in the affected area to adequately respond to this potentially devastating closure.

Response: NMFS disagrees that additional time was warranted for public comment on the DeSoto Canyon closure alternative. During the public hearing period for the proposed rule (December 15, 1999, to March 1, 2000), NMFS received many comments indicating that an additional closure was needed in the northeastern Gulf of Mexico because of the historically high swordfish discard rate in the area. In response to this comment, NMFS conducted additional analysis and identified an area generally around the DeSoto Canyon that in fact did have high incidence of discards of swordfish relative to swordfish kept. Although the DeSoto Canyon is included within areas that were analyzed in the DSEIS and draft Technical Memorandum (made available November 1999), NMFS decided that an additional comment period was needed specifically on the potential utility of this closure because pelagic longline effort has declined by greater than 50 percent in this area over the past 5 years. NMFS notified the public of its intentions to consider a sub-area of previously analyzed areas in the Gulf of Mexico (i.e., DeSoto Canyon) through the HMS fax network, which is sent to thousands of permit holders, seafood dealers and fish houses throughout the eastern United States. In addition, NMFS mailed the **Federal Register** notice with supplementary information summarizing the biological, economic, and social analysis of the DeSoto Canyon closure, and the VMS materials to all HMS pelagic longline permittees. As a result of the April 26, 2000, **Federal Register** notice (65 FR 24440) soliciting comment on this alternative, NMFS received hundreds of responses, indicating that adequate time was provided for comment.

Comment 29: Fish farming is the only answer to providing fish as a food for our population.

Response: NMFS agrees that aquaculture and mariculture play and have an important role to play in providing fishery products, but disagrees that they are the only answer.

Use of Time/Area Closures to Reduce Bycatch

Comment 1: NMFS should use time/area closures to reduce bycatch.

Response: NMFS agrees that closed areas can be an effective way to reduce bycatch, both in the U.S. and international pelagic longline fisheries, and this final rule implements time/area closures for the pelagic longline fisheries in the Gulf of Mexico and along the southeastern U.S. Atlantic coast. Due to efforts of the United States, ICCAT has asked its scientific committee to explore the use of closed areas throughout the management unit. Swordfish, marlin, sailfish, and other HMS are considered overfished and are currently experiencing overfishing Atlantic-wide. The rebuilding plans established in the HMS FMP and the Billfish FMP Amendment will be enhanced to the extent that reduction of bycatch will decrease mortality of juveniles and reproductive fish. Further, a reduction in swordfish discards is now critical for the U.S. pelagic longline fishery as a result of the 1999 ICCAT recommendation setting a North Atlantic discard allowance that is incrementally reduced to a zero tolerance level by 2004.

Comment 2: NMFS should change the size and/or shape of the proposed western Gulf of Mexico closed area.

Response: NMFS agrees and is closing the DeSoto Canyon area year-round to pelagic longline fishing to address undersized swordfish discards and to prevent further increases in swordfish discards as a result of possible effort displacement to this area in response to the southeastern U.S. Atlantic coastal closures. Further, NMFS has attempted to mitigate the economic effects of the actions specifically aimed at reducing billfish bycatch, by eliminating the proposed western Gulf closure and by prohibiting use of live bait by pelagic longline vessels in the Gulf of Mexico instead. This gear modification is potentially as effective in reducing sailfish discards as the western Gulf closure and is approximately half as effective in reducing marlin discards. However, in consideration of the magnitude of U.S. billfish discards relative to Atlantic-wide levels and the extent of the economic impacts associated with the proposed western Gulf closure, modifying fishing practices is a viable alternative that effectively accomplishes the objectives of reducing billfish bycatch while allowing fishing to continue in the western Gulf of Mexico.

Comment 3: Several commenters supported a closure of the Charleston

Bump area. Conversely, other commenters stated that the level of fishing activity in the Charleston Bump area does not warrant closure of this area.

Response: Although pelagic longline activity in the Charleston Bump area results in bycatch of small swordfish throughout the year, over 70 percent of the swordfish bycatch takes place during February through April. Therefore, NMFS is closing the Charleston Bump area for this 3-month time frame of the highest discard rates. This partial year closure addresses the bulk of swordfish discards while minimizing social and economic impacts of the rule by allowing fishing for 9 months, rather than the year-round closure included in the proposed Agency action. Minimizing the temporal component of the Charleston Bump closure also reduces the magnitude of potential increases in sea turtles interactions and white marlin discards predicted by the displaced effort model for the proposed rule. Nevertheless, NMFS is aware of the overall concerns regarding this area relative to potential increases in effort and concomitant effects on bycatch and incidental catch and will monitor fishing activity to determine whether a larger/longer closure is necessary in the Charleston Bump area. If necessary, NMFS would pursue further action through the FMP framework process.

Comment 4: NMFS should consider additional pelagic longline closed areas in a future rulemaking.

Response: NMFS agrees that additional closed areas may be necessary to address bycatch, bycatch mortality, and incidental catch, particularly to address sea turtle takes as discussed in section 5.8 of the FSEIS. Shifts in fishing effort patterns may also warrant future rulemaking to close affected areas. NMFS will continue to monitor the pelagic longline fleet throughout its range.

Comment 5: NMFS should change the shape, size, and/or timing of the South Atlantic proposed closed area.

Response: NMFS agrees. NMFS is closing the southern part of the proposed Southeast area below 31°N latitude (East Florida Coast) year-round in order to maximize the bycatch reduction benefits. The northern portion of the proposed closed area (Charleston Bump) is closed for the period of highest swordfish discards during February through April. NMFS may consider a larger closure in the Charleston Bump area if effort increases significantly in this area, resulting in increased incidental catches or discards of overfished HMS or protected species.

NMFS would pursue this action through the FMP framework process.

Comment 6: NMFS should include a closure of the Mid-Atlantic Bight and/or a Northeast area to pelagic longline gear.

Response: NMFS disagrees that this rule should close the Mid-Atlantic Bight and/or Northeast coastal statistical areas. The areas closed by this rule are considered temporal and spatial "hot spots" for HMS bycatch from U.S. pelagic longline effort within the U.S. EEZ, as evaluated by the frequency of occurrence and the relationship between total catch and discard rates. NMFS has included a closure in the mid-Atlantic area as part of the final HMS FMP to reduce bluefin tuna discards from pelagic longline gear. Nevertheless, NMFS recognizes that pelagic longline effort will likely increase in areas that remain open (as analyzed in the redistribution of effort model in FSEIS). By minimizing the size of the closure in the Gulf of Mexico and shortening the closed season for the Charleston Bump area, NMFS expects that the effects of effort redistribution would be lessened from those evaluated in the DSEIS and proposed rule. Considering HMS bycatch, closures of the Mid-Atlantic Bight, beyond the June pelagic longline closure for bluefin tuna discards, or in the offshore waters in the Atlantic Ocean off the northeastern United States are not warranted at this time. NMFS will continue to monitor the pelagic longline fleet throughout its range and will take appropriate action if necessary through the proposed and final rule process to reconfigure closures. In addition, as required by the BO, NMFS will consider measures to reduce and monitor interactions with sea turtles, particularly in the pelagic longline fishing grounds on the Grand Banks. Such measures may include area closures.

Comment 7: NMFS should close areas to both commercial and recreational pelagic fishing. NMFS should consider closing areas to recreational rod and reel fishermen, particularly to protect small bluefin tuna.

Response: NMFS disagrees. The closures included in the final rule address the requirements of national standard 9, while minimizing, to the extent practicable, the significant economic impacts that will be experienced by this fishery, as required by national standard 8. Monitoring programs in place do not identify the recreational fishery as a source of excessive bycatch. In fact, NMFS established a catch-and-release fishery management program in the Billfish Amendment in recognition of the operational patterns of the recreational

fishery to encourage further catch and release of Atlantic billfish. However, NMFS continues to address both monitoring of the recreational fishery and any bycatch mortality that does occur. At this time, NMFS encourages recreational fishermen to increase survival of released fish through the use of dehooking devices, circle hooks, and other gear modifications that may reduce stress on the hooked fish. Further, depending upon the availability of funding, NMFS will offer educational workshops in order to reduce bycatch in the recreational fishery.

Comment 8: NMFS should consider "rolling closures" to spread the impacts throughout the region.

Response: NMFS considered and rejected rolling closures. The HMS and Billfish APs advised NMFS that rolling closures may not be effective. MFS conducted analyses to consider closures with varying spatial limitations on a seasonal basis along the southeastern U.S. Atlantic coast; however, none were as effective as the final action (see section 7 of the FSEIS). Economic impacts of the closures were minimized, to the extent practicable, in light of the objectives of the conservation measures.

Comment 9: NMFS should use oceanographic conditions to define the size, shape, and timing of area closures.

Response: NMFS agrees that many life history characteristics of HMS are driven by oceanographic conditions, including the strength of the Gulf Stream in the Atlantic, the loop current in the Gulf, and the eddies that spin off these structures. By following long-term distributional patterns in establishing the temporal and spatial components of the closures, oceanographic conditions were indirectly utilized in defining and evaluating the effectiveness of the time/area closures. The sizes of the closures around the Charleston Bump and DeSoto Canyon are examples of how NMFS accounted for variations in the current patterns to establish the closed area boundaries.

Comment 10: NMFS should alter the closed areas to be consistent with Congressional proposals.

Response: NMFS disagrees. The objectives of the legislative proposals are not identical with those of this action. This final rule reflects the four objectives stated in the proposed rule: (1) maximize the reduction of finfish bycatch; (2) minimize the reduction in target catch of swordfish and other species; (3) consider impacts on the incidental catch of other species to minimize or reduce incidental catch levels; and (4) optimize survival of bycatch and incidental catch species.

NMFS has reviewed the various legislative proposals and provided, in testimony before Congress, an analysis of the relative effectiveness of the closures following the methods outlined in the FSEIS. In addition to bycatch reduction, the legislative actions also consider gear interactions and economic mitigation through a buyout program, which are beyond the scope of this rulemaking.

Comment 11: The closures proposed by NMFS ignore an historically high area of swordfish discards and nursery grounds in the DeSoto Canyon in the northeastern Gulf of Mexico.

Response: NMFS agrees and is closing an area in the northeastern Gulf of Mexico that includes the DeSoto Canyon. In the draft Technical Memorandum issued with the proposed rule, NMFS had evaluated the closure of a larger area in the Gulf of Mexico (area Bill D) that included the DeSoto Canyon. However, the primary objective for closures in the Gulf of Mexico in the proposed rule was to reduce billfish discards in the western Gulf of Mexico. In responding to comments on the use of live bait, NMFS noted in the FSEIS (see section 7.2) that the higher discards in the western Gulf were a likely result of fishing practices rather than a reflection of relatively higher abundance. Historically, catches of small swordfish were high in the DeSoto Canyon area; however there has been considerably less effort in this area in recent years, which is likely a reflection of the stricter minimum size limit for swordfish with no tolerance. Further rationale for the northeastern Gulf of Mexico closure is to prevent additional effort in this area by pelagic longline fishermen displaced from the southeastern U.S. Atlantic coast closures, which could negate the effectiveness of East Florida Coast and Charleston Bump closures in reducing swordfish discards.

Comment 12: NMFS should reconsider the proposed closed areas because the increase in the bycatch of blue marlin, white marlin, and large coastal sharks is not "worth" the decrease in swordfish bycatch expected to result from the proposed closed areas.

Response: The effort redistribution model used in the DSEIS and FSEIS is based on the assumption that all effort in the closed areas is randomly distributed throughout the remaining open areas and, as such, offers an estimation of the "worst-case scenario" from a biological perspective. This model estimates that discards of blue marlin could increase by 6.6 percent and white marlin by 10.8 percent. Blue marlin bycatch rates may be over-

estimated by the effort redistribution model because the model estimated bycatch rates by assuming random or constant catch-per-unit-effort in all remaining open areas. This estimation procedure could skew results for certain species if those species are concentrated in certain areas, instead of being randomly distributed over the entire open area (see section 7 and appendix C of the FSEIS for full description of analytical procedures). Pelagic longline effort in the Caribbean (fishing areas below 22° N. latitude) represents approximately 14 percent of the total U.S. Atlantic-wide fishing effort, but accounts for over half of the total blue marlin discards by U.S. pelagic longline vessels. These areas were not considered for closure since they are generally located outside U.S. EEZ waters. Therefore, it is likely that the no-effort redistribution model would be more applicable for blue marlin (12 percent reduction in discards). White marlin discards were less concentrated in the Caribbean (32 percent of total Atlantic-wide levels) and did not show any identifiable patterns, particularly after the live bait effects were removed from the catch patterns. Therefore, the effort redistribution model (11 percent increase in white marlin discards) is probably more applicable in this case, indicating that white marlin discards are problematic and will need to be closely monitored. The prohibition of live bait in the Gulf will potentially further reduce Atlantic-wide discard levels of blue marlin and white marlin by approximately 3 percent and sailfish by 15 percent. Because large coastal sharks are overfished, management efforts that reduce discards (33.3 percent under the effort redistribution model) are likely to be beneficial to stock recovery and, in that regard, meet the objectives of the final rule.

Comment 13: The closures included in the proposed rule will not be effective in rebuilding overfished HMS stocks unless huge areas of the Atlantic Ocean outside the U.S. EEZ are also closed.

Response: National standard 9 requires FMPs to take actions to minimize bycatch to the extent practicable. The management actions included in the final rule have been formulated to meet the bycatch reduction directive of national standard 9, consistent with the requirements of other national standards for FMPs. To the extent that reducing bycatch and bycatch mortality impacts juvenile and reproductive HMS populations, the final actions may augment rebuilding programs for the overfished HMS stocks. While NMFS agrees that unilateral

management action by the United States cannot rebuild overfished HMS stocks, the United States has been a leader in conservation of HMS resources and has taken many management actions (e.g., the time/area closures) to show the international forum our willingness to take the critical steps necessary to conserve these stocks. U.S. leadership has been used as a primary negotiation tool at ICCAT. The swordfish rebuilding program adopted by ICCAT in 1999 was based in large part on the rebuilding plan outlined in the HMS FMP. To the extent that the United States can use time/area closures and other bycatch reduction management strategies to convince other ICCAT member entities that bycatch can be minimized, the actions contained in the final rule may have a significant impact on Atlantic-wide rebuilding of overfished HMS stocks.

Comment 14: The entire Gulf of Mexico should be closed to pelagic longline fishing.

Response: NMFS disagrees that closure of the entire Gulf of Mexico to pelagic longline fishing is warranted. The proposed closure of the western Gulf of Mexico was predicated on the relatively higher billfish discards associated with the pelagic longline fishery operating in that area. Additional information and analyses obtained by NMFS subsequent to the publication of the DSEIS and proposed rule on December 15, 1999, indicate that prohibition of live bait could reduce blue and white marlin discards in the Gulf of Mexico by approximately 10 to 20 percent, and sailfish discards by 45 percent, depending upon the analytical procedure used. Closure of the DeSoto Canyon area in the northeastern Gulf of Mexico, although only a third the size of the western Gulf of Mexico closure (32,800 square miles versus 96,500 square miles), will provide a greater benefit in the reduction of swordfish discards (4 percent reduction Atlantic-wide versus a 3.1-percent increase under the effort redistribution model) and will prevent vessels displaced from the southeastern U.S. Atlantic coastal closures from fishing in an area with an historically high rate of swordfish discards. The cumulative benefits of the northeastern Gulf closure and live bait prohibition meet the objectives of the final rule by providing a reasonable alternative to reduce bycatch rates, while minimizing economic and social impacts throughout the Gulf of Mexico.

Comment 15: NMFS has already closed too many areas to commercial fishing. The proposed closures will eventually lead to total closure of the

entire Atlantic region to commercial fishing.

Response: NMFS disagrees that the final rule closures will lead to elimination of the commercial pelagic longline fishery. However, NMFS agrees that use of time/area closures as a fishery management tool must involve careful consideration of the impact of Agency action on all components of both the commercial and recreational fisheries. Implementation of practicable conservation measures that meet Magnuson-Stevens Act directives is the overarching objective of the Agency. To that end, NMFS has reduced the spatial and temporal constraints of the proposed closures and included a gear modification (prohibition of live bait) to help mitigate the economic and social concerns expected to result from the actions originally proposed.

Comment 16: Closure of the DeSoto Canyon area, in addition to the western Gulf closure, will displace vessels into the Atlantic and/or Caribbean, which will negate the conservation measures associated with the closures.

Response: NMFS disagrees because the effort redistribution model assumes that effort is displaced randomly throughout the remaining open areas. Therefore, the conservation benefits associated with the final action closures account for movement of effort into the Caribbean, Mid-Atlantic Bight, or any other open area. Further, since the final rule does not close the western Gulf of Mexico, it is likely that the limited fishing effort currently expended within the DeSoto Canyon closure area (approximately one-third the size of the proposed Gulf closure) will be dispersed largely within the Gulf of Mexico.

Comment 17: The proposed time/area closures are unjust, unnecessary, and inequitable and, as such, will result in further lawsuits against NMFS.

Response: National standard 9 of the Magnuson-Stevens Act requires that NMFS take action to reduce bycatch to the extent practicable. The use of time/area closures is a practicable means of reducing bycatch of HMS resources while considering the economic concerns of participants in the pelagic longline fishery who target these overfished, international fishery resources. The IRFA, RIR, and other components of the DSEIS clearly identified the significant economic, social, and community impacts associated with the proposed time/area closures. NMFS selected conservation measures in the final rule that meet the directives of the Magnuson-Stevens Act, while being mindful of the requirements of national standard 8 to minimize negative economic, social, and

community impacts, to the extent practicable.

Comment 18: The DeSoto Canyon closure is needed to protect a swordfish nursery area, but it needs to be larger to be more effective.

Response: NMFS agrees that the DeSoto Canyon area is an area with an historically high ratio of swordfish discarded to swordfish kept. NMFS does not agree that additional closed areas are warranted at this time. The analysis undertaken for the FSEIS included catch history from the entire northeastern Gulf of Mexico, east of the Mississippi River, and north of 26° N. latitude (general location of the U.S. EEZ). Although effort has been declining around DeSoto Canyon in recent years, NMFS has selected this area for a closure to prevent further effort from being expended in this area, either by displaced effort from the Atlantic or by vessels shifting operations from other areas of the Gulf of Mexico.

Comment 19: NMFS should have considered closures in the Caribbean, including the EEZ around Puerto Rico and the U.S. Virgin Islands, to protect spawning populations of swordfish and billfish.

Response: Closed areas in the Caribbean were considered. However, as discussed in the DSEIS and FSEIS, closures were generally limited to U.S. EEZ waters where they would have maximum impact on all pelagic longline fishing effort. NMFS agrees that the Caribbean waters support important HMS spawning and nursery areas as identified in the essential fish habitat components of the HMS FMP and the Billfish FMP Amendment. Pelagic longline effort in the Caribbean (fishing areas below 22° N. latitude) by U.S. flagged vessels is very effective in targeting swordfish with relatively low discard rates (approximately 6.7 fish kept to 1 discarded, as compared to an average 0.9 swordfish kept to 1 discarded in the DeSoto Canyon area). Conversely, the U.S. pelagic longline effort in the Caribbean represents approximately 14 percent of the total U.S. Atlantic-wide fishing effort, but accounts for over half of the total blue marlin discards by U.S. pelagic longline vessels. NMFS did not select a closure in the Caribbean area because of the extensive range of the fishing effort in the Caribbean, which occurs mainly in international waters. In addition, the configuration of the EEZ around both Puerto Rico and the U.S. Virgin Islands would make closures relatively ineffective.

Comment 20: NMFS should close the DeSoto Canyon area in addition to, not

in place of, the proposed western Gulf of Mexico closure.

Response: NMFS agrees that the DeSoto Canyon should be closed year-round to reduce swordfish discards and prevent an increase in fishing pressure in this area as a result of displaced effort from the East Florida Coast closure. However, NMFS does not agree that the proposed western Gulf of Mexico closure (March to September) is also warranted at this time. The final rule includes a prohibition on the use of live bait on pelagic longline gear in the Gulf of Mexico. Analysis of this alternative indicates that prohibiting the use of live bait is likely to be as effective in reducing sailfish discards as the western Gulf closure, and about half as effective in reducing marlin discards. However, in consideration of the magnitude of U.S. billfish discards relative to Atlantic-wide levels and the extent of the economic, social, and community impacts associated with the proposed western Gulf closure, modifying fishing practices is a reasonable alternative that effectively accomplishes the objective of reducing billfish bycatch, to the extent practicable, while allowing fishing to continue in the western Gulf of Mexico.

Comment 21: There is no reason for NMFS to close the DeSoto Canyon area to pelagic longline gear.

Response: NMFS disagrees. The rationale for closing the DeSoto Canyon area year-round to pelagic longline fishing is twofold. The first is to prohibit fishing in an area with an historically low ratio of swordfish kept to number of undersized swordfish discarded, which over the period of 1993 to 1998 has averaged less than one swordfish kept to one swordfish discarded. The second is to prevent further increases in swordfish discards as a result of effort displacement into this area from the Florida East Coast year-round closure.

Comment 22: The closures included in the proposed rule are more effective than the measures contained in various bills being considered in Congress.

Response: There are several bills currently before Congress. It is difficult at this time to predict whether any of the bills will be enacted and, if a bill is enacted, what measures it will contain. The objectives of the legislative proposals are also different in some respects from those of NMFS' final action.

Comment 23: Although the original proposed rule and the additional DeSoto Canyon closed area may not be contrary to ICCAT recommendations, they violate sections of the Magnuson-Stevens and Atlantic Tunas Convention

Acts. The action is not being taken to comply with ICCAT recommendations.

Response: NMFS disagrees that the proposed and final rules violate the Magnuson-Stevens Act and ATCA. In fact, if NMFS failed to address the issues developed in the final action, the Agency would be in violation of Magnuson-Stevens Act directives related to national standard 9. Further, the 1999 ICCAT recommendation established a dead discard allowance that will require the United States to reduce swordfish discards by 25 percent from 1998 levels (i.e., 443 mt to 320 mt) during the 2000 fishing year; any discards in excess of the dead discard allowance will be taken off the following year's quota. The dead discard allowance is subsequently reduced to 240 mt in 2001, 160 mt in 2002, and 0 mt by 2004. Thus, consistent with the ICCAT recommendation, NMFS must take action to reduce swordfish dead discards.

Gear Modifications

Comment 1: NMFS needs to do gear research specifically for the Atlantic pelagic longline HMS fishery. Results from gear modification research on other fisheries may not have the same effectiveness when applied to the Atlantic pelagic longline fishery.

Response: NMFS agrees that research on gear modifications would be most helpful if conducted in the Atlantic pelagic longline fishery. In fact, several gear-based data collection and research programs have been specifically directed on the Atlantic HMS pelagic longline fisheries. One study is looking at whether gear modifications, such as circle hooks, can reduce bycatch mortality and whether they are cost-effective. Results are either inconclusive or too preliminary for application in this final rule. Funding is very limited at this time, so research results from other study areas are often applied to similar fisheries (e.g., western Pacific tuna longline and Gulf of Mexico tuna longline fishery).

Comment 2: NMFS should provide exempted fishing permits (EFPs) to research vessels in closed areas to investigate the effectiveness of gear modifications and fishing practices to reduce bycatch and incidental catch interaction with pelagic longline gear.

Response: NMFS agrees. Researchers must obtain a Scientific Research Permit (SRP) or EFP from NMFS to conduct research in a closed area with pelagic longline gear. A mechanism exists whereby NMFS can grant an SRP/EFP in order to obtain data (50 CFR 600.745). If a research team submits the required information, including a research plan,

NMFS would consider granting an SRP/EFP subject to the terms and requirements of the existing regulations.

Comment 3: NMFS received comments both supporting and opposing a regulation requiring the use of circle hooks in HMS fisheries. Comments include the following: Require them on commercial and/or recreational HMS vessels; do not require them; they are safer than regular hooks, and better, cheaper, and more effective than the DSEIS indicated.

Response: NMFS agrees that circle hooks are a promising tool that can be used in many hook and line fisheries to improve survival of hooked fish and turtles that must be released. NMFS has funded a study, now underway in the Azores, to evaluate the effectiveness of circle hooks on sea turtle interactions and survival. If analyses indicate that circle hooks are a cost-effective way to increase turtle survival, NMFS may issue regulations requiring the use of such gear. NMFS seeks the cooperation of all fishermen to explore the use of circle hooks as a means to reduce bycatch mortality, which is less expensive and may have less economic impact than other measures (e.g., more extensive time/area closures). Many recreational anglers have already switched to circle hooks, particularly when fishing with dead bait, with several recent articles in sportfishing magazines reporting on the value of using circle hooks to reduce hooking-related mortality levels. In certain fisheries, commercial fishermen have already adopted circle hooks as well, as there is evidence of increased catch rates for some target species (e.g., yellowfin tuna).

Comment 4: Some commenters noted that NMFS should prohibit the use of live bait in the pelagic longline fishery. Conversely, other commenters noted that, if NMFS prohibits live bait, fishermen will switch from targeting tuna to targeting swordfish. Since many pelagic longline fishermen operating in the Gulf of Mexico have incidental swordfish permits, this might result in increased discards of swordfish.

Response: NMFS agrees that live bait should be prohibited. Live bait is used for 13 percent (logbook data) to 21 percent (observer data) of all pelagic longline sets in the Gulf of Mexico. Logbook and observer data indicate that blue and white marlin discards occur approximately twice as frequently on hooks with live bait; sailfish are discarded four to five times more frequently when live bait is used. Live bait is generally used to target yellowfin tuna, although dead bait is used on the majority of pelagic longline sets.

Prohibiting live bait may lead to additional use of squid or other dead bait, which may be less effective than live bait in catching yellowfin tuna, but is a reasonable alternative to a closure of the western Gulf of Mexico as a means of reducing billfish bycatch. Some fishermen may switch from targeting tuna (daytime fishery) to targeting swordfish with dead bait, thereby increasing swordfish discards. However, fishing for swordfish with pelagic longline gear generally takes place during night-time hours and has an added expense and complexity with the use of light sticks. In anticipation of fishermen targeting swordfish in the Gulf of Mexico in reaction to this prohibition, NMFS has implemented a time/area closure in a known swordfish nursery area in the eastern Gulf of Mexico (DeSoto Canyon) in an attempt to avoid the increased catch rates of small swordfish there. Further, if longline fishermen holding an Incidental category swordfish permit experience increased swordfish catch rates, NMFS may need to reconsider the incidental catch limit and the allocation of swordfish quota to the directed fishery. Prohibiting the use of live bait could be just as effective in reducing sailfish discards (approximately 15 percent reduction from the Atlantic-wide U.S. totals during 1995 through 1998) as the western Gulf closure. Although the live bait prohibition would be somewhat less effective in reducing marlin bycatch discards than the March to September area closure (e.g., blue marlin: 3.3 percent vs. a 7.2-percent reduction under the displaced effort model), it is less costly and is a practical alternative to the western Gulf closure.

Comment 5: NMFS should implement other gear modifications (e.g., decreasing length of longline, decreasing soak time, and timing of sets).

Response: NMFS agrees that gear modifications could be effective at reducing bycatch. However, many of these measures are difficult to enforce or could be circumvented by altering fishing patterns (e.g., additional sets made or increased soak time to offset a shorter mainline), resulting in no bycatch reduction. NMFS continues to support research projects regarding effectiveness of gear modifications.

Comment 6: NMFS should allow the U.S. Atlantic pelagic longline fishery 1 year to voluntarily reduce bycatch with the use of self-imposed gear modifications.

Response: As a result of a 1999 ICCAT recommendation setting Atlantic-wide discard quotas, the United States must

immediately reduce swordfish discards during the 2000 fishing year to 320 mt. This will have to be a significant reduction from 1998, when a total of 443 mt of swordfish discards from the North Atlantic were reported by the United States. The ICCAT recommendation also incrementally reduces the dead discard allowance to zero by the 2004 fishing year. Any dead discards over the annual allowance will be taken off the following year's quota. Therefore, NMFS has determined that it is necessary to initiate mandatory bycatch reduction measures at this time.

Comment 7: NMFS should limit the soak times of pelagic longline gear to reduce the number of dead discards.

Response: NMFS evaluated an alternative in the FSEIS that would reduce pelagic longline soak time to 6 hours. The strategy would reduce the amount of time that pelagic longline gear could be deployed and thus reduce fishing effort (hours/hook) for each longline set. The current range of soak time for pelagic longline gear is 5 to 13 hours. This alternative was rejected based on the practicality of enforcement and the likelihood that fishermen would make two sets during a day, or otherwise extend a fishing trip to execute a similar level of effort/trip. Since most billfish hit a longline hook during setting or retrieving, requiring a measure that forced a greater frequency of hooks moving through the water column could increase billfish discards. However, limiting soak to reduce sea turtle takes will likely be considered in developing alternatives to address concerns raised in the BO.

Environmental Justice

Comment 1: The proposed closed areas would disproportionately affect African-Americans in South Carolina, Vietnamese-Americans in the states bordering the Gulf of Mexico, and low-income crew members.

Response: NMFS considered environmental justice concerns as required by E.O. 12898 in selecting the preferred actions of the final rule. By minimizing the size of the closure in the Gulf of Mexico through prohibiting the use of live bait and by shortening the closed season for the Charleston Bump area, NMFS expects that the economic and social effects of the closures on minority groups and all other components of the pelagic longline fishing community will be minimized to the extent practicable.

Protected Species

Comment 1: NMFS should re-designate the longline fishery from a Category I to a Category II fishery under

the MMPA because the fishery bycatch meets the criteria for a Category II designation.

Response: NMFS classifies fisheries on an annual basis. Classification criteria consist of a two-tiered, stock-specific approach that first addresses the total impact of all fisheries on each marine mammal stock, and then addresses the impact of individual fisheries on each stock. NMFS bases its classification of commercial fisheries on a variety of different types of information. The best source of information concerning the level of fishery-specific marine mammal incidental serious injury and mortality is the fishery observer program. If observer data are not available, NMFS may use fishermen's reports submitted per the requirements of the Marine Mammal Authorization Program since 1996 (or the Marine Mammal Exemption Program from 1989 to 1995), stranding data, data from other monitoring programs, and other sources of information. The Atlantic pelagic longline fishery has been monitored with about 2 to 5 percent observer coverage, in terms of sets observed, since 1992. The 1992–1997 estimated take was based on an analysis of the observed incidental take and self-reported incidental take and effort data. The 1998 stock assessment reports, which were used for the 1999 List of Fisheries, included data which placed the pelagic longline fishery into Category I. NMFS will reevaluate categories in developing the 2001 List of Fisheries. However, NMFS anticipates using serious injury data, which would likely cause the pelagic longline fishery to remain in Category I.

Comment 2: NMFS should be more concerned about fishermen than about sea turtles.

Response: NMFS is concerned about achieving conservation benefits of the final rule while at the same time minimizing expected economic impacts on fishermen and related businesses, to the extent practicable. However, NMFS also must be in compliance with the Endangered Species Act, which requires NMFS to take appropriate actions to protect endangered or threatened species (e.g., sea turtles). The final rule includes reasonable actions that meet requirements of the Magnuson-Stevens Act and ATCA (as it applies to swordfish discards) to reduce bycatch and seek long-term rebuilding of overfished HMS stocks, while balancing economic and social impacts. Even so, it is clear that the final actions will have significant social and economic impacts on various components of the pelagic longline communities. NMFS recognizes

those impacts and has noted possible sources of economic relief (see section 8.0 of FSEIS).

Comment 3: The projected increase in turtle takes as a result of the proposed closures (under the redistribution of effort model) is not likely because many boats are not capable of redistributing their longline effort to the Grand Banks.

Response: NMFS agrees that turtle bycatch rates may be over-estimated by the effort redistribution model because estimation of catch-per-unit-effort in the remaining open areas could be skewed if species are concentrated in one area (such as sea turtles in the Grand Banks or blue marlin in the Caribbean; see FSEIS for further information), rather than randomly distributed over the entire open area. Although fishing in the Grand Banks area requires a relatively larger vessel than currently utilized in some of the closed areas (e.g., east Florida coast) for practical and safety reasons, it is possible that some boats could commence fishing on the Grand Banks or increase current effort in this area due to the closures in other areas, resulting in potential increases in turtle interactions. It is not known at this time how many vessels are expected to redistribute their effort to areas and times where turtle interactions are highest, but fishing activities will be continually monitored through the VMS program, as well as through logbooks and on-board observers. The anticipated takes for loggerheads and leatherback sea turtles for pelagic longline gear established by the incidental take statement were exceeded during 1999, as discussed in section 5.8 of the FSEIS. The June 30, 2000 BO contained jeopardy findings for both loggerhead and leatherback sea turtles. NMFS is initiating efforts to address this issue, including possible regulatory and non-regulatory actions.

Dolphin/Wahoo Issue

Comment 1: Comments were received that the mahi "loophole" undermines the effectiveness of the HMS time/area rule; Vessels using longline gear to target dolphin (mahi) should be prohibited from the HMS pelagic longline closed areas; NMFS should continue to work with the Councils to coordinate closed areas to reduce bycatch; If an exception is made for the closed area, HMS longline fishermen may move into the dolphin fishery.

Response: NMFS has notified the respective fishery management councils of the jurisdictional issues presented by vessels fishing with pelagic longline gear for species that are not directly managed by the Secretary of Commerce (e.g., dolphin). The South Atlantic

Fishery Management Council has prepared a Draft Dolphin and Wahoo Fishery Management Plan with a preferred alternative that would prohibit the use of pelagic longline gear for dolphin and wahoo in areas closed to such gear under HMS regulations. NMFS cannot predict whether HMS longline fishermen will move into the dolphin fishery, but it is unlikely that there would be a major shift in effort. Vessel operators may not fish with pelagic longline gear in closed areas if they hold an HMS permit; therefore, they would have to relinquish all HMS permits in order to do so. NMFS does not expect that longline fishermen would sell their swordfish and tuna permits in order to target dolphin for a seasonal fishery of limited size and duration.

Comment 2: NMFS should implement emergency regulations until the respective Councils can close the potential loophole posed by the longline fishery for dolphin.

Response: If the level of fishing effort targeting dolphin increases, it will most likely be due to factors other than the time/area closures implemented for bycatch reduction in the tuna/swordfish longline fisheries. It is unlikely that vessels affected by the HMS closures would give up HMS permits specifically to conduct a dolphin fishery. NMFS and the respective Councils can monitor effort, catch, and bycatch of non-HMS permitted longline fishermen targeting dolphin in the HMS closed areas and determine whether further action is required. The South Atlantic Fishery Management Council has already undertaken preliminary steps in preparing a proposed Dolphin and Wahoo FMP that includes parallel closures.

Comment 3: No billfish or swordfish are caught in the mahi fishery; NMFS should not shut down the mahi longline fishery; it has virtually no discards and the stock is healthy; NMFS needs to analyze the dolphin fishery more closely in evaluating the impacts of the pelagic longline time/area closure.

Response: Recognizing the jurisdictional issues, NMFS has asked the appropriate fishery management councils to examine management options guiding the use of pelagic longline gear to target dolphin. In the FSEIS, NMFS has included a more detailed discussion of the potential bycatch issues in the pelagic longline fishery for dolphin. Logbook reports from 1998 were examined for all sets made in the area from Key West, FL, to Wilmington Beach, NC. It was not possible to identify effort in the dolphin fishery with certainty, but sets were

separated into those targeting swordfish/tunas/sharks and those listing a target as "other." It was presumed that sets listing a target as "other" are predominantly targeting dolphin, and this was reflected in the nearly tenfold higher catch per set of dolphin. While swordfish and bluefin tuna discards were generally lower for the presumed dolphin sets, bycatch of billfish, sharks and bigeye, albacore, yellowfin, and skipjack (BAYS) tunas seems to be a concern. More specific information on catch occurring when pelagic longlines are set to target dolphin would be needed to confirm or refute the bycatch concerns. In the interim, to facilitate enforcement and to take a precautionary approach, NMFS has decided that HMS-permitted vessels should be prohibited from setting all pelagic longline gear in the closed areas, regardless of target species. It is possible that an operator of an HMS-permitted vessel who wishes to target dolphin could apply for an exempted fishing permit (EFP). If EFPs are issued, the data collected (e.g., logbook or observer reports) can be used to determine whether a dolphin fishery could be undertaken that would be consistent with the bycatch reduction objectives of the HMS FMP. However, such authorization for EFPs would have to be considered in consultation with the councils having management authority for dolphin.

Redistribution of Effort

Comment 1: More pelagic longline fishermen will relocate to open fishing areas than exit the fishery as a result of the time/area closures.

Response: To estimate the range of potential ecological impacts of the time/area closures, NMFS examined two scenarios for effort reallocation: (1) all effort in the closed area is removed from the system (worst-case alternative from the economic, social and community standpoint) and (2) all effort is randomly moved to available open areas (which may overestimate impact of effort if a species is not relatively uniformly distributed throughout the area—see discussion of sea turtle and blue marlin distribution in the FSEIS). Available information is insufficient for NMFS to estimate the number of vessels that may decide to discontinue fishing or to determine where the remaining vessels will relocate. However, if total U.S. pelagic longline effort is reduced by vessels leaving this fishery, the estimates of the effectiveness of the time/area closures will be underestimated.

Comment 2: The NMFS western Gulf of Mexico proposed closure would force displacement of pelagic longline effort

into known bycatch areas, particularly the DeSoto Canyon area in the eastern Gulf of Mexico, resulting in net losses in conservation effectiveness of the time/area closures.

Response: NMFS agrees that this is a possibility. The areas selected in the proposed rule were based on areas and times when discard rates were relatively higher than those in other temporal/spatial alternatives ("hot spots"). The overriding objective for the proposed closure in the Gulf of Mexico was to reduce billfish discards. A relatively higher discard-per-unit-effort was noted for marlin and sailfin in the western Gulf of Mexico. In conducting the analyses for the proposed rule, NMFS also recognized that there were discards of swordfish in the eastern Gulf; however, there was a relatively lower occurrence of billfish discards, particularly blue and white marlin, in this eastern area. Therefore, in consideration of the fact that the western Gulf area also had discards of undersized swordfish, NMFS selected this area for closure in the proposed rule. Information that became available subsequent to the preparation of the proposed rule and consistent with public comments received has provided additional insight into the differential bycatch of billfish from pelagic longline sets using live bait, a fishing practice which has occurred mainly in the western Gulf of Mexico. NMFS anticipated that this fishing technique would be moved to the eastern Gulf of Mexico if the proposed closure were implemented, resulting in an increase in billfish bycatch in this area. The final rule incorporates a prohibition on the use of live bait on pelagic longline gear which will reduce billfish bycatch without the need for a closure in the western Gulf of Mexico. As a result, NMFS re-examined other areas in the Gulf of Mexico and is closing the DeSoto Canyon and a portion of the west Florida shelf based on the historically high ratio of swordfish discards to swordfish kept in these areas. Further, this action will prevent an expansion of displaced fishing effort into this area following closures along the southeastern U.S. Atlantic coast.

Comment 3: Displaced boats will re-flag to another country or sell their vessel and gear to ICCAT non-member countries in the Caribbean, or other areas, which will negate any gain in the reduction of billfish and undersized swordfish discards by U.S. commercial pelagic longline effort.

Response: It is possible that U.S. owners will decide to sell their vessel(s) to citizens of one of the Caribbean countries. NMFS has information that

indicates that many Caribbean nations (some which may not be members of ICCAT) are interested in expanding their fishing fleets for HMS. NMFS is involved with many United States initiatives regarding issues of illegal, unregulated and unreported (IUU) fishing, including those developed through ICCAT and FAO. The recent ICCAT restrictions on swordfish imports from Honduras and Belize are evidence of this international effort. ICCAT also continues to work with Caribbean nations to discuss allocation criteria for these nations, as well as adherence to ICCAT recommendations, which has been a source of concern.

Comment 4: The time/area closures will increase competition in the shark fishery because pelagic longline vessels will re-rig to undertake bottom longline fishing.

Response: NMFS disagrees. The shark fishery operates under a limited access permit system. Most pelagic longline vessels have qualified for limited access shark permits. The level of retention allowable under an incidental permit is not sufficient to support profitable operations focusing on shark resources. While some pelagic longliners have directed permits and it is possible that some fishermen could purchase a directed shark permit, the total number of directed permits is capped, and the shark fishery operates under a quota system; therefore total effort and relative competition between vessels should remain unchanged.

Comment 5: NMFS will force pelagic longline fishermen with small vessels to fish farther from shore, which could be unsafe during inclement weather. NMFS should consider safety-at-sea implications of the proposed closed areas.

Response: NMFS agrees that vessel safety is an important component to be considered in developing reasonable management measures, as required by national standard 10 of the Magnuson-Stevens Act. Some pelagic longline vessels historically operating in the areas being closed are not capable of safely fishing farther out to sea in the open areas due to their size. However, the vast majority of pelagic longline effort targeting swordfish and tuna occurs in deep waters, generally in waters with depths in excess of 500 fathoms (3000 feet), requiring a vessel of sufficient size to safely handle open ocean conditions. The final rule closures should not adversely impact most of these vessels in regard to seaworthiness, particularly with the removal of the western Gulf of Mexico closure and reducing the temporal restrictions of the Charleston Bump

closure. However, there is a fleet of small pelagic longline vessels that fish the deep waters found relatively close to shore along the east Florida coast. This area will be closed year-round because of the magnitude of reported swordfish and billfish discards. If these vessels are moved to open areas that require fishing at a greater distance from shore, NMFS encourages vessel operators to follow U.S. Coast Guard-approved operating procedures and to exercise caution in determining the safe operating range for their sizes and types of vessels.

Comment 6: Directed shark fishermen should be allowed to catch more sharks since bycatch of large coastal sharks in the pelagic longline fishery would be reduced with the time/area closures.

Response: NMFS disagrees. Shark resources in the United States are either overfished (large coastal sharks), fully fished (small coastal) or unknown (pelagic sharks). Each shark category has a set harvest level that encompasses catch from all fishing sources. Time/area closures may result in an increase in pelagic shark discards and landings of approximately 8 and 4 percent, respectively, under complete effort redistribution. Conversely, the number of large coastal sharks discarded and landed from pelagic longline gear will likely decrease by 33 and 18 percent, respectively, which may increase the duration of the large coastal shark fishing season. However, further increases in shark quotas are not warranted at this time.

Comment 7: The effort redistribution model included in the DSEIS predicts an increase in BAYS tuna landings, but the United States has agreed to limit effort in the yellowfin tuna fishery under an ICCAT agreement.

Response: While NMFS agrees that, under the effort redistribution model, BAYS tuna landings may increase (mainly as a result of increased yellowfin tuna catches), the ICCAT agreement limits U.S. yellowfin effort to 1993 levels. The catch levels predicted by the effort redistribution model are based on total effort redistribution and, as such, are likely to be an over-estimation of actual effort and catches under the final rule time/area closures. As a result of the HMS FMP, a limited access system is now in place for the tuna pelagic longline fishery, and a recreational limit of three yellowfin tuna per person per trip was also implemented. Commercial yellowfin tuna landings in 1993 were 4,386 mt, while more recently (1996 to 1998), landings have averaged approximately 3,525 mt. The nearly 10 percent increase in BAYS landings predicted by the displaced effort model would increase

average annual landings to only 3,700 to 3,800 mt, without an overall increase in effort.

Comment 8: Fishermen can and will fish in closed areas with other types of fishing gear.

Response: In the FSEIS, NMFS analyzed the potential impacts of fishermen changing target species through redistributing effort to other fisheries in which the vessel already may be active, or pursuing new fisheries by purchasing permits, as necessary. The South Atlantic Fishery Management Council is currently holding public hearings on a proposed dolphin/wahoo FMP that includes a preferred alternative that would prohibit pelagic longline fishing for dolphin and wahoo within the spatial and temporal constraints of closures for the HMS pelagic longline fishery. This could reduce effort redistribution from HMS to the dolphin and wahoo fisheries.

Comment 9: If Agency actions force fishermen to fish in areas with high turtle interactions, then the Agency is responsible for any increase in take, not fishermen.

Response: NMFS disagrees. The final time/area closures along the southeastern U.S. Atlantic coast were temporally and spatially reconfigured to mitigate, to the extent practicable, the impact of effort redistribution on sea turtle interactions. Turtle bycatch rates may be over-estimated by the effort redistribution model because estimation of catch-per-unit-effort in the remaining open areas could be skewed if species are concentrated more in one area (like sea turtles in the Grand Banks) rather than randomly distributed over the entire open area. NMFS will continue to monitor the fishery after implementation of the final rule. As a result of the jeopardy findings for loggerhead and leatherback sea turtles, NMFS will issue additional regulations that may include further modifications to gear and/or fishing methods, closed or limited fishing areas, and expanded monitoring (see section 5.8 of the FSEIS).

Comment 10: The majority of directed swordfish and tuna pelagic longline fishermen are not active in other commercial fisheries.

Response: NMFS disagrees. Of the 329 fishermen with swordfish limited access permits who held valid permits as of May 9, 2000, approximately half held only HMS limited access permits. The other fishermen held a range of permits including king mackerel, Spanish mackerel, golden crab, reef fish, red snapper (both Class 1 and Class 2 licences), rock shrimp, snapper-grouper, and spiny lobster. In addition, some of

the vessel permit holders held permits in fisheries that are managed by the Northeast Regional Office.

Comment 11: The closure will have unknown benefits because reallocation of effort will change the catch composition.

Response: NMFS examined a range of impacts of effort reallocation, including removal of all effort from closed areas to redistributing all effort to available open areas. While the models used by NMFS provide estimates of potential increases or decreases in catch and discards, NMFS agrees that a full, quantitative assessment of effort reallocation cannot be made until the closures are implemented and fishermen develop new fishing patterns. However, the closures implemented through the final rule will significantly reduce impacts on the level of discards from the U.S. pelagic longline fishery in the U.S. EEZ, which was the goal of the action. NMFS will monitor vessel activity through the use of VMS, observers, logbooks, and dealer reports.

Comment 12: The time/area closures will force vessels to increase effort and/or move into other South Atlantic fisheries for which they hold permits. Boats will move into the bottom longline fishery and catch grouper, snapper, and tilefish or shift to other pelagic longline fisheries, like dolphin and wahoo, in either the impacted closed areas or other locations along the Atlantic coast.

Response: NMFS agrees that some vessels will likely expend effort in other fisheries. Although some pelagic longline fishermen who homeport their vessels in the closed areas have other permits (e.g., coastal migratory pelagics, snapper-grouper, charter vessels), many have only directed or incidental swordfish, shark and tuna permits. Most of the southeastern fisheries require Federal permits, some of which are issued under limited access programs. Limited access permits may not be available, which may limit the ability of displaced pelagic longline fishermen to target other species. Other vessels may move into other activities consistent with their fishing experience (e.g., recreational charter fishing). The dolphin and wahoo fishery resources are not under the direct management jurisdiction of the Secretary of Commerce. However, the Agency agrees that some pelagic longline effort may be directed toward dolphin and wahoo. The South Atlantic Fishery Management Council has prepared a proposed dolphin/wahoo FMP that includes a preferred alternative prohibiting pelagic longline fishing for dolphin and wahoo within the spatial and temporal

constraints of closures for the HMS pelagic longline fishery. The FSEIS provides an analysis of potential impacts of alternative fishing activity by displaced HMS pelagic longline vessels.

Analysis of Ecological Benefits of Closures

Comment 1: The DSEIS indicated that the proposed time/area closures would have a huge reduction in bluefin tuna discards, but reducing bluefin tuna bycatch is not listed as an objective of the Agency action.

Response: NMFS disagrees that reduction of bluefin tuna discards was not included as an objective of the proposed Agency action, which had four clear objectives: Maximize the reduction of finfish bycatch (which includes bluefin tuna); minimize the reduction in the target catch of swordfish and other species; ensure the incidental catch of other species remains unchanged or is reduced; and optimize the survival of released animals. Analysis of time/area closure effectiveness used for the proposed rule encompassed all closures for HMS, including the annual northeastern U.S. pelagic longline closure during June developed specifically to reduce bluefin tuna discards that was part of the final rule implementing the HMS FMP. Closures included in the final rule are listed by species and area to clarify the cumulative impacts for each spatial component. Bluefin tuna discards increased by 11 percent when pelagic longline effort was randomly redistributed throughout the operational range of the U.S. Atlantic pelagic longline fishery as a result of the East Florida Coast and Charleston Bump closures; however, when combined with the June closure already in place, the net effect on bluefin tuna is a 39-percent reduction in discards.

Comment 2: The Agency should have considered a more expansive scientific information baseline for evaluation of potential closures, including scientifically peer-reviewed literature prior to the 1995 to 1997 information included in the DSEIS, as well as more updated and/or near real-time data sources (e.g., satellite data).

Response: In preparing the FSEIS, the Agency expanded the data analyses to include logbook information from 1993 to 1998. These data provide further support for the temporal and spatial components of the time/area closures of the final rule. Historical scientific studies describing movement behavior of HMS, as well as oceanographic studies of current and water mass patterns were also reviewed in preparing the FSEIS. Setting closures or

other fishing activities based on near real-time satellite information on water or current patterns may be considered in future management actions, particularly in conjunction with the communication capabilities of the VMS systems required for all pelagic longline fishing vessels beginning September 1, 2000. Recent scientific studies on the relationship between billfish discard rates relative to use of live and dead bait on pelagic longline gear were also used.

Comment 3: The evaluation of closed areas should be based on the ratio of catch to bycatch instead of absolute numbers of bycatch.

Response: NMFS agrees that the ratio of catch to bycatch should be used in evaluating which areas to close, but disagrees that the absolute numbers of bycatch should not be considered. In developing the final area closures, NMFS examined, where appropriate, the temporal and spatial variations of the ratio of bycatch to target catch, the absolute numbers of bycatch and target catch, and relative fishing effort. For example, an area that has a high discard to number kept ratio may be indicative of a problem area, depending upon the relative volume of fishing effort that is currently or historically conducted in the area. Conversely, an area that has a relatively high absolute number of discards but a low ratio of discards to number of fish kept would be evaluated based on the relative fishing effort in the area. The analytical methods are fully described in the DSEIS, and clarified, where appropriate, in the FSEIS.

Comment 4: A target bycatch threshold should be developed to allow for a tracking of the success of Agency actions.

Response: NMFS disagrees. The development of the proposed and final rules clearly follows a multispecies management approach, and as such, it is inappropriate to set target reductions for specific species without considering the impact on the remaining portion of the catch composition. For example, if the time/area closures were simply based on reducing swordfish discards by a set percentage, this could disproportionately increase the level of bycatch, bycatch mortality, and/or incidental catch of other species. The four overarching objectives discussed in the DSEIS and FSEIS guided the Agency throughout the development of the proposed and final actions.

Comment 5: NMFS should investigate the effectiveness of the pelagic longline closure in the Pacific Ocean to evaluate potential impacts of closures along the U.S. Atlantic coast.

Response: NMFS agrees that all similar closures should be evaluated to

determine potential biological, social, and economic impacts of final Agency actions. The closure of nearly 1 million square miles of Pacific Ocean near Hawaii to pelagic longline fishing vessels has been in effect since December 23, 1999; therefore, information on the impacts is limited at this time.

Comment 6: Observer data should be used to evaluate accuracy of the logbook reports used in the NMFS time/area analyses.

Response: NMFS agrees that observer coverage is needed to ground-truth information provided in the mandatory logbook program. The Draft Technical Memorandum, included as part of the DSEIS, provides a discussion of the limitations of logbook data and explains the rationale for using these data. The Atlantic pelagic longline fishery has been monitored with about 2 to 5 percent observer coverage, in terms of sets observed since 1992, and is used to ground-truth the mandatory logbook data, and to provide specific biological information (e.g., tagging, obtaining tissue samples for genetic work). The observer information was used in developing the prohibition on the use of live bait.

Comment 7: The analyses of the time/area closures are flawed because of the dependence upon mis-reported information in the mandatory logbooks.

Response: NMFS disagrees that the analyses are flawed. While NMFS recognizes that there are limitations and constraints in the use of logbook information as discussed in the Draft Technical Memorandum and HMS FMP, these data undergo thorough review by NMFS scientists and can be used to identify catch trends and patterns over time. Also, if logbooks under-report bycatch as indicated in public comment, then the benefits of the time/area closures are even greater than predicted in the FSEIS.

Comment 8: Use of percentages in the analyses make it difficult to assess benefits of the time/area closures.

Response: To allow for valid analysis of temporal and spatial variations in closure effectiveness on a suite of target species and bycatch, it was necessary to have a common denominator for all comparisons. The total U.S. Atlantic catch, by year and species, was used for this purpose, and was provided in tabular form in the DSEIS. The percentages provided in the analyses can easily be converted to number by multiplying the percentage value by the appropriate annual total (landings and discards were considered as separate groups). In the FSEIS, NMFS further clarifies the use of percentages,

numerical values, and ratios of numbers caught to numbers discarded.

Comment 9: NMFS should not lump all BAYS together in the analysis of the time/area closures. Each tuna species should be separately analyzed, particularly for yellowfin tuna.

Response: NMFS agrees that it is important to separate out the impact of the time/area closures on the various species of the BAYS tuna complex. Atlantic-wide, yellowfin tuna and bigeye tuna represent over 91 percent of the U.S. pelagic longline fleet catch of BAYS tunas (YFT—70.4 percent and bigeye tuna—20.8 percent). In the Gulf of Mexico, the 99.1 percent of the BAYS harvested from the proposed western Gulf closed area consisted of yellowfin tuna; in the final rule closure of DeSoto Canyon, yellowfin make up 98.4 percent of the BAYS complex. The BAYS tunas in the closure of the southeastern U.S. Atlantic coast consist of 89.5 percent yellowfin tuna and 7.5 percent bigeye tuna. The potential changes in landings of yellowfin tuna, bigeye tuna, the aggregate BAYS complex, and bluefin tuna are summarized for each final action under the effort redistribution and no effort redistribution models described in the FSEIS.

Comment 10: NMFS should summarize the impacts of the time/area closures separately for the Gulf of Mexico and southeastern U.S. Atlantic coastal closures.

Response: NMFS agrees. Ecological and economic impacts may be better understood if summarized both separately and in combination, and, to that end, this presentation approach is taken in the FSEIS. Although the DSEIS combined the ecological impacts for the Gulf of Mexico and southeastern U.S. Atlantic coastal closures under the discussion of each alternative, the draft Technical Memorandum provided results of the no effort redistribution and effort redistribution models separately for each closure area.

Comment 11: NMFS should consider incorporating tagging data into the time/area analysis procedures.

Response: NMFS agrees that information from tagging studies of billfish, tunas, sharks, and other species released by recreational and commercial fishermen provides valuable data on the range and movement patterns of these species and, as such were included in the qualitative procedures used to identify general areas for potential closure.

Comment 12: The proposed Agency action is focused only on reducing swordfish discards, and does not consider the impacts on vessels.

Response: NMFS disagrees. The evaluation of the time/area closure fishery management strategy in the DSEIS and FSEIS followed a multi-species approach. Consistent with the objectives, patterns in the discards, bycatch and incidental catches of billfish, sea turtles, bluefin tuna, pelagic and large coastal sharks, and other overfished HMS were used to define time/area closures. The areas selected for closure in the final rule also seek to minimize the target catch of swordfish, tuna, dolphin, and other species and, thus, minimize the economic impacts on vessel owners. The evaluation of the impacts of the closures included all components of the pelagic longline catch, as well as those of dealers within the time/area closure locations.

Mitigation of Economic Impacts

Comment 1: NMFS should provide economic compensation for the displaced vessels and dealers who are negatively impacted from the closed areas (various vessel buyout schemes were suggested ranging from recreational permit fees to having the remaining commercial fishermen compensate those who go out of business; other schemes included employing all displaced longline fishermen in fish hatcheries). While vessel owners can sell their permits and receive some compensation, dealers cannot. NMFS should provide resources for retraining or education of displaced longline fishermen.

Response: NMFS recognizes that the time/area closures will adversely affect many vessels and dealers, and that the ripple effects of the closures will go beyond the immediate community of fishermen, and affect fishing families, associated businesses, and the larger coastal economy. NMFS also recognizes that the Magnuson-Stevens Act requirements to rebuild overfished fisheries and reduce bycatch are going to result in economic hardships—even closure of some businesses. Once the stocks are rebuilt, it may still not be possible for all the affected individuals to make a living because many fisheries are currently overcapitalized. NMFS has made a concerted effort to identify possible sources of economic relief for individuals and businesses affected by the regulatory measures in this rule. Some government agencies, such as the Small Business Administration, the Economic Development Administration, the Farm Credit System, the U.S. Department of Labor's Economic Dislocation and Worker Adjustment Assistance Act, may provide fishing industry participants with loans, training for new jobs, and/or grants for

economically stressed communities, and the Fisheries Finance Program could support an industry-sponsored vessel buyback. A summary of the types of buyback programs, loans, and government agencies that may be able to help are listed in section 3 of the FSEIS.

Comment 2: NMFS needs to consider other alternatives that might have fewer and lesser adverse economic impacts.

Response: In developing this final rule, NMFS considered and adopted a variety of options that minimize bycatch and bycatch mortality, achieve the same conservation goals, and mitigate the rule's economic impact. These options include smaller closed areas and/or shorter closed periods than were proposed. In addition, the final rule substitutes a prohibition on the use of live bait in the Gulf of Mexico for the proposed closed area in the western Gulf. These alternatives are likely to have less of an adverse economic impact on fishermen and communities than the alternatives in the proposed rule.

Comment 3: NMFS received a number of comments regarding permit buyouts, including the following: NMFS should buy out displaced longline vessels; NMFS should not buy out displaced longline vessels; thousands of businesses fail every day and those businesses do not ask tax payers to buy them out; NMFS should destroy any longline vessels that are bought out; and, without a buyout, many companies will go out of business.

Response: This rule does not include a fishing capacity reduction program (buyback program); however, NMFS may implement a buyback program for this fishery if circumstances warrant. Any buyback program will be implemented in accordance with the Magnuson-Stevens Act, NMFS fishing capacity reduction regulations, and other applicable law. Under section 312 of the Magnuson-Stevens Act, NMFS may implement buyback programs that purchase fishing permits from permit holders or, alternatively, it may implement buyback programs that restrict vessels from participating in other fisheries by requiring that they be scrapped or be subject to title restrictions. The buyback method selected will depend on particular circumstances present when such buyback program, if any, is implemented. Furthermore, NMFS has concluded that it does have the authority to initiate and implement buyback programs for fisheries under the direct management authority of the Secretary of Commerce. Regulations implementing section 312, published May 18, 2000 (65 FR 31444), provide that "for a fishery under the direct

management authority of the Secretary, NMFS may conduct a program on NMFS' own motion by fulfilling the requirements * * * that reasonably apply to a program not initiated by a request." Because of the significant negative economic impacts expected with this final rule, NMFS has made a concerted effort to identify possible sources of economic relief for individuals and businesses affected by regulatory measures in fishery management. A summary of the types of buyback programs, loans, and government agencies that may be able to help are listed in Section 3 of the FSEIS.

Comment 4: This proposed rule may cause Congress to abandon the legislative buyout that has been under consideration.

Response: NMFS announced in the 1999 HMS FMP that the Agency was committed to reducing bycatch and bycatch mortality, as required in the Magnuson-Stevens Act, and would proceed with rulemaking to address bycatch concerns. NMFS cannot predict what this rulemaking may have on Congressional action.

Comment 5: NMFS should recognize that there are economic and competitive disadvantages to businesses geographically close to the proposed closed areas.

Response: NMFS agrees and is aware of the potentially significant economic impacts to related businesses, not just to fishermen. However, these areas were not chosen with respect to the impacts on a specific region but rather to target "hot spots" for pelagic longline bycatch. Because of the anticipated significant economic impacts, NMFS has selected alternatives that minimize those impacts while still maintaining conservation benefits similar to those in the proposed rule. In the Gulf of Mexico, NMFS chose to prohibit live bait in lieu of the large Western Gulf closure and has also implemented a smaller closed area that focuses on swordfish bycatch reduction. Although this area has a year-round closure, it is also located offshore so that smaller fishing vessels may still be able to fish. Thus, businesses near this closure may not be affected to the same extent as they would be if the area extended to the coast. In addition, as discussed earlier, NMFS has made a concerted effort to identify possible sources of economic relief for individuals and businesses affected by regulatory measures in fishery management.

Comment 6: NMFS should reconsider limiting the capacity of the Atlantic pelagic longline fleet. NMFS should not implement further regulations and instead should monitor the fishery

while giving the limited access program a chance to "settle." Limited access was an important first step that has not been given a chance to provide benefits.

Response: NMFS agrees that limiting access to the fishery is an important step. In July 1999, NMFS implemented limited access in the pelagic longline fleet. While it is true that limiting access to this fishery could provide an incentive for fishermen to reduce bycatch because they have an investment in the future of the fishery, NMFS has a mandate under the Magnuson-Stevens Act to minimize bycatch, to the extent practicable. In addition, the limited access program in place now was designed to reduce latent effort, not to reduce fishing effort. As a result, there is still excess capacity in this fishery. For example, of the 450 permit holders who qualified for a directed or incidental swordfish limited access permit, only 208 reported landings in the pelagic logbook in 1998. While other permit holders may be reporting landings in other logbooks, NMFS believes that many permit holders who do not fish regularly can still be bought out by fishermen who may be more active. Therefore, as announced in the HMS FMP and the 2000 SAFE report and in addition to this rule to reduce bycatch and bycatch mortality in the pelagic longline fishery, NMFS continues to monitor the status of this fishery and, if necessary, will work with the APs to consider additional steps to reduce fishing effort.

Comment 7: NMFS should make fishermen pay for an observer instead of VMS.

Response: NMFS agrees that a user fee system for funding observer coverage could be beneficial. However, a VMS program to track vessels in areas where bycatch is a concern has some advantages in that it costs less, is less intrusive, and has some vessel safety benefits. NMFS will continue to examine means of applying user fees in fisheries subject to observer coverage. In the interim, the Atlantic pelagic longline fishery VMS requirement is effective beginning September 1, 2000.

Comment 8: Minimizing bycatch through large area closures will result in greater overall economic benefits for all fishing industry sectors.

Response: NMFS agrees that minimizing bycatch enhances rebuilding of overfished stocks and, over the long term, should increase the economic benefits for all fishing sectors. However, in the short term, large area closures will force many small entities, such as fishermen and dealers, out of business. NMFS has chosen to close the areas that will provide the greatest

conservation and economic benefits in both the short and long terms. Because of the jeopardy finding for loggerhead and leatherback sea turtles, NMFS will propose additional measures to reduce the level of turtle takes. This could include a closure of the Grand Banks for the months of September through December, modifications in fishing methods, gear modifications, and increased monitoring activities.

Comment 9: Every effort should be made to mitigate the economic loss to commercial fishermen; however, given the current strong economy, there is ample opportunity for those disadvantaged by the closures to make a financial recovery.

Response: NMFS agrees that the economic loss to the commercial fishermen must be minimized as long as the conservation goals can still be achieved. Fishermen and others who lose their job or go out of business as a result of this rule may be able to relocate to either a different job altogether, or to a different job within the fishing industry. To aid displaced individuals, NMFS identified possible sources of economic relief for individuals and businesses affected by regulatory measures in fishery management. A summary of the types of loans and government agencies that may be able to help are listed in 3 of the FSEIS.

Comment 10: NMFS needs to consider actions to minimize economic impacts associated with moving families to areas that remain open to pelagic longline fishing.

Response: NMFS is aware that some families will need to move as a result of these regulations and that the cost of moving may be high. To examine more fully these impacts, NMFS published a **Federal Register** document (65 FR 24440) on April 26, 2000, asking specifically for comments on the impact of delaying the effective date to provide sufficient time to relocate. The comments received are discussed here. Also, as a result of these concerns, NMFS is delaying implementation of some of these regulations for different lengths of time.

Comment 11: The DeSoto Canyon closure is keyed to reducing swordfish discards and the analysis focuses on the social and economic impacts on the swordfish longline fishermen and their associated fishing communities. Other fisheries and fishing communities are likely to be affected by this closures and should be considered in the analysis.

Response: NMFS agrees that a variety of fisheries and fishing communities should be considered in undertaking efforts to minimize bycatch and bycatch mortality. As this final rule is directed

at the activities of only pelagic longline fishermen, the analyses focus on the impacts to the pelagic longline fishery and communities. As NMFS collects additional information on other fisheries (e.g., recreational, bottom longline), NMFS may determine that additional rulemakings are needed to reduce bycatch and bycatch mortality in those fisheries. If NMFS undertakes such rulemakings, it will conduct analyses to determine the impact of those rules.

Comment 12: Many comments were received about the effective date. These comments included the following: NMFS should do the right thing and insist that the closures not be reduced and that they be implemented no later than 30 days after publication of the final rule expected on August 1; The closures must be enacted immediately without any delay; Fishermen and related businesses would need at least one full year prior to implementation to move and resettle into other regions; If NMFS is not going to provide compensation, NMFS needs to delay implementation by at least 6 months to relocate entire businesses, find a new docking facility, relocate staff, find a new church, find new schools for children, and find a new house; The swordfish rebuilding measures implemented last November at ICCAT are risk-prone and have less than a 50-percent chance of rebuilding in 10 years. Given this, NMFS needs to implement these closures immediately to reduce pressure on the stock and increase the chance of sticking to the rebuilding schedule.

Response: NMFS agrees that fishermen and related businesses will need time to relocate in response to the closures in this final rule. NMFS disagrees that even a short delay of these regulations would hinder rebuilding or cause irreparable harm to the resource. Any dead swordfish discards that happen between the publication of the final rule and implementation will be taken off the U.S. swordfish dead discard allowance included in the rebuilding plan. Thus, NMFS has decided to delay the implementation of the closures: 90 days for the DeSoto Canyon area (November 1, 2000) and 180 days (February 1, 2001) for the East Florida Coast closure, which coincides with the annual date that the seasonal Charleston Bump closure begins. Thus, the closures in the Southeast Atlantic would begin at the same time, making the regulations less confusing and allow fishermen and related businesses approximately 6 months to relocate if they so decide. The implementation of the DeSoto Canyon

closure is not delayed for as long, because this closure is not as large an area as is the one the Atlantic and it is further offshore. Thus, fishermen who have fished pelagic longlines in the DeSoto Canyon area may be able to find alternative fishing sites within the Gulf of Mexico without having to relocate the home port of the vessel, and less time is necessary to prepare.

Comment 13: Unless NMFS undertook a detailed analysis of the behavior of longline fishermen and processing industry to investigate the impacts of delaying the effective date (costs, vessel's choice, etc.), any decision to delay implementation would be essentially arbitrary.

Response: NMFS disagrees. NMFS believes that commercial fishermen, dealers, and processors provided enough information in their comments on how long and why delayed implementation is needed for NMFS to make an informed decision.

Comment 14: NMFS asked the wrong question in regard to delayed implementation. The correct question is what approach would produce the highest net economic benefits, not what are the short-term gains.

Response: NMFS believes that asking the commercial fishing industry why they need delayed implementation and how long a delay it should be provides information needed for NMFS to decide the optimal approach. NMFS does not believe the highest net economic benefit would be achieved if all of the commercial fishermen were asked to move within 30 days. Instead, NMFS believes it could be more beneficial to the fishermen and the consumer if commercial industries were given time to relocate while still giving them time to fish during this season.

Comment 15: NMFS' entire approach on this rulemaking is fundamentally flawed because the Agency does not have the ability nor the authority to initiate an effort buyout program for Atlantic HMS.

Response: NMFS disagrees. NMFS announced in the HMS FMP that it was committed to reducing bycatch and bycatch mortality and would initiate rulemaking for time/area closures based on comments received during that rulemaking. NMFS has previously concluded (65 FR 31444, May 18, 2000) that section 312 of the Magnuson-Stevens Act provides authorization for the Atlantic HMS buyout "on NMFS' own motion by fulfilling the requirements * * * that reasonably apply to a program not initiated by a request." While NMFS recognizes that a buyout program may provide some compensation for vessel owners, a

buyout program would not provide any compensation for other business owners. Instead, NMFS has explored other ways of minimizing economic impacts including smaller time/area closures, a prohibition on live bait, and delayed implementation.

Comment 16: Closing the DeSoto Canyon in addition to the western Gulf of Mexico would only increase any social and economic impacts to vessels and their support and supplier community-based infrastructures.

Response: NMFS agrees that closing both the proposed Gulf B area and the DeSoto Canyon would have even greater economic impacts than closing either one alone. In addition, preliminary analyses indicate that prohibiting live bait may have similar conservation benefits for billfish as closing the western Gulf of Mexico. For this reason, NMFS decided to close the DeSoto Canyon to minimize bycatch, particularly small swordfish, and prohibit live bait to minimize billfish bycatch.

Comment 17: The Vietnamese Americans who have settled in states bordering the Gulf of Mexico are especially vulnerable to social and cultural disruption since they are dependent upon commercial fishing as a traditional livelihood that provides stability.

Response: NMFS agrees that the Vietnamese American fishermen may be affected by the social and economic impacts of these regulations. However, NMFS mitigated impacts to the fishermen in these final regulations by deciding against closing the Western Gulf of Mexico and choosing to prohibit live bait. Thus, although these fishermen may need to alter the current method of fishing, they should not need to relocate.

Comment 18: NMFS failed to factor in the economic benefits from decreased swordfish discards which would be added to the United States' total allowable landings under the ICCAT swordfish rebuilding program if swordfish discards are reduced below ICCAT targets.

Response: NMFS disagrees that the Agency failed to factor in the economic benefits from decreased swordfish discards in relation to the 1999 ICCAT swordfish rebuilding program. NMFS recognizes that reducing dead discards is crucial in order for U.S. fishermen to continue to land the full swordfish quota allocated to the United States (see section 7 of the FSEIS). For a full analysis of the social, economic, and conservation benefits of the 1999 swordfish rebuilding program, see the

preamble to the proposed rule (64 FR 33519, December 15, 1999).

Comment 19: Adding the DeSoto Canyon area closure to the Western Gulf of Mexico closure still would not save that many blue and white marlins. NMFS must weigh that against the economic devastation the closures will cause.

Response: NMFS agrees that economic impacts must be considered. However, NMFS does not believe that Agency needs to "balance" the economic impacts against the conservation benefits. The Magnuson-Stevens Act mandates NMFS to rebuild overfished stocks, prevent overfishing, and minimize bycatch and bycatch mortality for all stocks, not just billfish. Recently, the U.S. Court of Appeals for the District of Columbia Circuit ruled that the Magnuson-Stevens Act requires NMFS to give priority to conservation benefits and to consider adverse economic impacts if two alternatives achieve the same conservation benefits. NMFS recognizes that some regulations that meet this mandate will cause economic harm and has provided a summary of alternatives that may help affected fishermen and communities in Section 3 of the FSEIS. In addition, NMFS has analyzed many different areas and seasons in order to determine whether time/area closures will be effective at meeting the goals of this FSEIS, which time/area closures are the most effective, and which time/area closures are effective but have the least economic impacts. NMFS believes that the management measures chosen will meet all of the goals of this action and minimize the economic impacts, to the extent practicable.

Social and Economic Analyses

Comment 1: NMFS received comments on the extent of the impacts of the proposed closed areas on the fishing fleet, including: One-third of the fleet would go out of business; hundreds of coastal communities would be negatively impacted; many fishermen would need to relocate; and the closures fall disproportionately on minority and low-income communities.

Response: Comments received on the proposed rule helped NMFS to develop final regulations that would minimize the impacts of the potential closed areas while yielding similar (or better) conservation benefits. For example, many comments suggested that NMFS consider the DeSoto Canyon area both instead of and in addition to the proposed western Gulf closure (area Gulf B). NMFS found that the proposed Gulf B closure could reduce the total gross revenues from the entire pelagic

longline fleet by 6.4 percent while the DeSoto Canyon closure might reduce the total gross revenues from the entire fleet by 2.2 percent. In addition, while analyses indicate the Gulf B closure could increase swordfish discards by 3.9 percent, the DeSoto Canyon closure could decrease swordfish discards by 4.1 percent. In the South Atlantic, the proposed closure could reduce swordfish discards by 27.7 percent and reduce total gross revenues to the fleet by 19.2 percent while the final closure could reduce swordfish discards by 27.3 percent and reduce total gross revenues for the fleet by only 9.0 percent.

Comment 2: The closures will have almost no adverse impact on any group including commercial longline fishermen, as shown by NMFS' analyses. The economic and biological benefits of these zone closures far outstrip any commercial interests.

Response: NMFS disagrees that this rule will not have any adverse impacts. NMFS' analyses, as supported by numerous comments received, indicate that many fishermen, dealers, and related industries could go out of business as a result of this rule. In addition, this rule will have ripple effects throughout the entire fishing community, commercial and recreational, and into other jobs and industries such as mechanics, engineers, and fishing supply markets. The analyses conducted for this rule indicate that the closed areas and times will have positive biological impacts and significant negative economic impacts for some businesses. NMFS has tried to achieve the conservation goal of minimizing bycatch while minimizing the economic impacts.

Comment 3: Restrictions on commercial fishermen have economic impact not just on dealers and wholesalers but also on local grocery stores, welders, truckers, electrical technicians, mechanics, food banks, and other people in all communities.

Response: NMFS agrees that this rule will have indirect impacts beyond the immediate fishing industry. However, non-fishing industries are already dependent on a range of businesses and industries. Although some initial adverse impacts may occur, these indirectly affected industries should be able to adjust through increased business in other non-fishing sectors.

Comment 4: The economics of the pelagic longline fishery are integrated with other fisheries from a dealer's perspective.

Response: NMFS agrees. In both the initial and final regulatory flexibility analyses and the regulatory impact review, NMFS analyzed the impact of

this rule on dealers. NMFS stated that, as a result of this rule, some dealers may lose a substantial amount of fish previously supplied from fishermen who have been issued a directed or incidental swordfish permit. However, the actual amount of gross revenues dealers lose will depend on the type of fish and the amount of fish dealers can obtain from other fishermen and other fisheries. Although NMFS believes this regulation will have a significant economic impact on HMS dealers who are located in coastal ports adjacent to the closed areas, most dealers are not as specialized as fishermen are, and they may be in a position to develop alternative business opportunities (e.g., purchases of other domestic fish products, import/export, value-added processing).

Comment 5: Closing the DeSoto canyon area will force some businesses to close.

Response: NMFS agrees; assuming no effort redistribution, the economic analyses for the DeSoto Canyon closure indicate that approximately eight vessels (4 percent) would lose half of their gross revenues and seven dealers who received fish from limited access permit holders (5.6 percent) would lose business volume equal to about half of the fish now handled. However, the economic impacts of the DeSoto Canyon are smaller than the anticipated economic impacts of the proposed Gulf B closure (12 vessels and 3 dealers losing half of their business). In addition, the closure of the DeSoto Canyon area has greater biological benefits for undersized swordfish than the proposed Gulf B closure. Thus, although some vessels may still go out of business as a result of this closure, the DeSoto Canyon area closure minimizes the economic impacts for most individuals. Also, the DeSoto Canyon area is located offshore, so smaller fishing vessels may still be able to fish adjacent open areas without relocating. This is not true of the Gulf B closure, which would have forced small vessels owners who wished to continue to fish to relocate.

Comment 6: With the closures, pelagic longline fishermen are likely to move into other areas. Many existing fishermen and countless others working in those areas will be devastated by the concentration of boats. NMFS has failed to analyze the impact of displaced fishermen on communities in the open areas.

Response: NMFS agrees that with this rule, many pelagic longline fishermen are likely to move into other areas. While this rule may increase user conflicts in some areas, NMFS feels that

this relocation will increase the social and economic benefits in many communities by increasing the level of economic activity in the area, including employment. It is likely that some dealers and marinas in the open areas or along the edges of the closed areas will see an increase in business as fishermen move. Other support businesses near the open areas will likely be similarly influenced. Also, communities in the closed areas may have some economic relief if they transfer effort from commercial fishing to recreational fishing. This may have the added benefits of lessening user conflicts in other areas and enhancing the recreational experience. In addition, due to the shorter Charleston Bump closure and the smaller DeSoto Canyon closure further off the coast, some fishermen in those areas may decide not to relocate.

Comment 7: Even though the quantity of swordfish available to consumers may not decrease due to imports, the quality of fresh swordfish will. Fresh fish should be available to everyone, not just to those who have the economic means to get it themselves or live across a line on a map. Even with a buyout, the level of economic activity will be diminished and consumers will lose access to the freshest product.

Response: NMFS agrees that it is advantageous when fresh fish is available to everyone, and future generations are considered in efforts to develop sustainable fisheries. For that reason, NMFS is working to rebuild overfished fisheries and to reduce bycatch and bycatch mortality while minimizing the economic impacts with methods such as time/area closures and gear modifications, without banning pelagic longline gear. These methods will allow the fishery to continue to provide as much fresh fish as possible.

Comment 8: This proposed rule should be considered as significant under Executive Order (E.O.) 12866.

Response: Both NMFS and the Office of Management and Budget (OMB) concluded that this rule does not meet the criteria for classification as "significant" for purposes of E.O. 12866 review. However, NMFS has prepared initial and final regulatory flexibility analyses as required by the Regulatory Flexibility Act (RFA). It should be noted that a rule could have a significant economic impact for purposes of the RFA without the rule being considered significant under the criteria of E.O. 12866.

Comment 9: The costs of the time/area closures have been overestimated while the benefits have been underestimated. NMFS has overestimated the man-hour cost of circle hooks. Many economic

benefits have been underestimated or omitted from the analysis of the economic impact of the proposed closures.

Response: NMFS agrees that some of the costs have been overestimated and some of the benefits have been underestimated. In both the initial and final regulatory flexibility analyses and the regulatory impact review, NMFS estimated the maximum economic impact of each alternative and understated many of the benefits. This is different than the analyses NMFS conducted to analyze the conservation impacts. Those analyses estimated the conservation impacts under no effort redistribution and effort redistribution models. The no effort redistribution model allowed NMFS to estimate the maximum biological benefits. The effort redistribution model allowed NMFS to estimate the minimum biological benefits. For the economic analyses, NMFS assumed no effort redistribution. This model allowed NMFS to estimate the maximum economic impact of the final regulations. If NMFS had assumed effort redistribution, the economic analyses would have indicated no change from the status quo or, perhaps, an increase in gross revenues (see section 7 of the FSEIS). While NMFS believes that the actual costs and benefits of the regulations will be somewhere between status quo and the costs described in the analyses, NMFS used the estimates from the most conservative models to make its decisions. This means that, for the biological estimates, NMFS used the effort redistribution model, and for the economic estimates, NMFS used the no-effort redistribution model. However, NMFS believes that many fishermen and related industries will adapt to the regulations and will continue to work in either the HMS fisheries or in others. However, because NMFS cannot predict the behavior of individuals, NMFS cannot estimate the exact cost or benefit any regulation will have. In addition, NMFS recognizes that the ripple effect of the closures will impact other business that provide goods and services to the pelagic longline fishery (e.g., tackle manufactures and suppliers; dock-side services, including ice, bait, fuel, dockage, labor; and vessel manufacture and repair). Although the final regulatory flexibility analysis and regulatory impact review provide a more thorough discussion of economic factors associated with the final Agency actions, NMFS does not have the necessary detailed economic information to make a quantitative

proposed rule and supplemental information meet all the requirements of the RFA. NMFS recognizes that the final regulations will have large impacts on many fishing families and communities but notes that the RFA does not preclude an Agency from implementing regulations having such impacts. NMFS chose final actions that meet the conservation goals and minimized the economic impacts, to the extent practicable.

Comment 18: Regional market gluts, especially associated with bad weather events and/or quota closures, should be expected to reduce ex-vessel prices.

Response: NMFS agrees that the time/area closures may have some impact on ex-vessel price particularly if closures or bad weather keep commercial fishermen from fishing in the open areas. However, given the extent of the remaining open areas in the Gulf and along the Atlantic coast, NMFS does not believe that the time/area closures would change the ex-vessel price significantly or cause significant market gluts.

Comment 19: NMFS should omit dealers who only import foreign fish from the analysis; in reality, domestic dealers who primarily offload and purchase "trip-fish" are few and far between and those in the closed areas will be impacted far greater than NMFS has analyzed.

Response: NMFS agrees that dealers who purchase most of their fish from vessels that now fish the designated closed areas will be greatly affected by these regulations. However, neither the IRFA nor FRFA considered imported fish. Instead, these analyses only considered fish sold to dealers by swordfish limited access permit holders.

Comment 20: Pelagic longline vessels need to gross at least \$500,000 year to be profitable; NMFS' estimate for gross ex-vessel revenues is too low.

Response: NMFS disagrees that the estimate for average ex-vessel gross revenues used in the IRFA and FRFA is too low. A number of studies performed on the voluntary economic add-on of the pelagic logbook indicate that many fishermen are operating on the margin and are not profitable. One study found that the average gross revenue per vessel was \$118,804. This is similar to the average of \$113,173 used in the IRFA and \$137,126 used in the FRFA. Thus, while some vessels may gross over \$500,000, the majority of vessels do not.

Changes From the Proposed Rule

For reasons explained in the responses to comments listed in the preceding text, NMFS has modified the proposed rule to balance bycatch reduction objectives with the need to

mitigate economic impacts. The proposed western Gulf of Mexico closure has been changed to a Gulf-wide prohibition on the use of live bait with pelagic longline gear. Also, the year-round DeSoto Canyon closed area has been added to further reduce dead discards of small swordfish. The proposed southeastern United States closed area has been split into northern and southern components: a seasonal (February 1– April 30) closure for the Charleston Bump area and a year-round closure for the Florida East Coast area.

To facilitate enforcement, several new definitions and prohibitions were added, and the proposed descriptions of fishing gear and the conditions for transit of the closed areas were revised. These revisions prohibit fishing activity of any type, regardless of gear actually deployed or target species, when a vessel issued an HMS permit is in a closed area with pelagic longline gear on board. Additionally, this final rule establishes a rebuttable presumption that fish on board a vessel in a closed area were taken in the closed area with a pelagic longline if that gear is on board. This imposes a burden on the vessel operator to demonstrate that such fish were taken outside the closed area (e.g., logbook entries, VMS signature).

Conclusions

In this final rule, NMFS prohibits pelagic longline fishing in areas with relatively higher bycatch rates because this alternative would best address the conservation and management objectives embodied in the FMP as required by the Magnuson-Stevens Act and ICCAT recommendations. Under the effort redistribution model, the final time/area closures, in conjunction with the live bait prohibition, are expected to reduce swordfish discards by 31 percent and sailfish discards by 29 percent; blue marlin and white marlin discards could increase by 3 percent and 7 percent, respectively. The final action time/area closures in the DeSoto Canyon, East Florida Coast and Charleston Bump could reduce the number of swordfish kept by 13 percent and the number of dolphin kept by 18 percent, while BAYS tunas landings would increase by nearly 10 percent.

The final area closures, together with the ban on live bait longlining in the Gulf of Mexico, appropriately meet the objectives of the Billfish and HMS FMPs and have the greatest likelihood of reducing bycatch while minimizing, to the extent possible, adverse impacts on fishing revenues and costs. Should future research indicate that practicable gear modifications could further reduce bycatch of managed HMS and/or

protected resources, NMFS will consider those gear modifications in conjunction with, or as an alternative to, time-area closures. In addition, NMFS will address turtle bycatch in the pelagic longline fishery in a separate rulemaking (see the following ESA discussion). Future regulatory measures to reduce sea turtle bycatch may involve additional area closures and/or further modifications to fishing gear and methods in defined areas of high interaction rates.

NMFS notes that there are similarities and differences between the time-area closures for pelagic longline gear contained in this final rule and those contained in legislation pending before Congress. Should any of the Congressional bills become law, NMFS will modify the measures contained in this final rule as necessary.

Compliance Guide

Under the Small Business Regulatory Enforcement Fairness Act of 1996, Federal Agencies are required to provide small business entities with a plain-language summary of how to comply with new regulations. Copies of the compliance guide for this final rule are available from Rebecca Lent (see ADDRESSES). To facilitate distribution, the compliance guide is also included in this document:

Q1: I am a recreational fisherman. Will these regulations affect me?

A: No. These regulations only affect commercial fishermen who use pelagic longline gear in the Atlantic ocean and have a Federal permit for Atlantic HMS.

Q2: I use pelagic longline gear. Will these regulations affect me?

A: Yes, if you have a Federal permit for Atlantic HMS. These regulations will prohibit you from fishing with pelagic longline gear in certain areas and times and from using live bait in the Gulf of Mexico. The Gulf of Mexico is the area of the U.S. EEZ west of 83° W. longitude as defined in 50 CFR 600.105 (c).

Q3: What is longline gear?

A: A longline is fishing gear that is set horizontally, either anchored, floating, or attached to a vessel, and that consists of a mainline with three or more leaders (gangions) and hooks, whether retrieved by hand or mechanical means.

Q4: What is pelagic longline gear?

A: Pelagic longline gear is defined as a longline that is suspended by floats in the water column and that is not fixed to or in contact with the ocean bottom. Your vessel has pelagic longline on board when:

1. A power-operated longline hauler,
2. A mainline,
3. High-flyers,

4. Floats capable of supporting the mainline, and

5. Leaders (gangions) with hooks are on board. Removal from the vessel of any one of these five elements constitutes removal of pelagic longline gear.

Q5: What are the areas where I can't fish using pelagic longline gear?

A: As of November 1, 2000, you will not be able to fish at any time using pelagic longline gear in the DeSoto Canyon area. This area, composed of two squares offshore of the west coast of Florida, is defined as the area within the following coordinates: 30°00' N. lat., 88°00' W. long.; 30°00' N. lat., 86°00' W. long.; 28°00' N. lat., 86°00' W. long.; 28°00' N. lat., 84°00' W. long.; 26°00' N. lat., 84°00' W. long.; 26°00' N. lat., 86°00' W. long.; 28°00' N. lat., 86°00' W. long.; 28°00' N. lat., 88°00' W. long.; 30°00' N. lat., 88°00' W. long.

As of February 1, 2001, you will not be able to fish at any time using pelagic longline gear in the East Florida Coast area. This area, located along the east coast of Florida through Georgia, is defined as the seaward area within the following coordinates: starting at 31°00' N. lat. near Jekyll Island, Georgia, and proceeding due east to 31°00' N. lat., 78°00' W. long.; 28°17' N. lat., 79°00' W. long.; then proceeding along the boundary of the Economic Exclusive Zone (EEZ) to 24°00' N. lat., 79°30' W. long.; then connecting by straight lines the following coordinates in the order stated: 24°00' N. lat., 79°30' W. long.; 24°00' N. lat., 81°00' W. long.; 24°00' N. lat., 81°47' W. long.; then proceeding due north to intersect the coast at 81°47' W. long. near Key West, Florida.

Also, as of February 1, 2001, you will not be able to fish using pelagic longline gear from February through April each year in the Charleston Bump area. This area, located off of North Carolina, is defined as 34°00' N. lat. near Wilmington Beach, North Carolina, and proceeding due east to connect by straight lines the following coordinates: 34°00' N. lat., 76°00' W. long.; 31°00' N. lat., 76°00' W. long.; then proceeding due west to intersect the coast at 31°00' N. lat. near Jekyll Island, Georgia.

Q6: Are all three areas closed year-round?

A: No. The Charleston Bump area is closed only February 1 through April 30 of each year. The other two areas, DeSoto Canyon and East Florida Coast, are closed year-round.

Q7: Are there any gear or fishing method restrictions in this rule?

A: Yes. As of September 1, 2000, in the Gulf of Mexico, pelagic longline fishermen are not allowed to use live bait. Setting up a live well or

maintaining live baitfish on board is prohibited. You may not have a tank or well attached to an aeration or water circulation device or have live baitfish if a pelagic longline is on board.

Q8: I am a recreational fisherman. Can I use live bait?

A: Yes. These regulations do not affect recreational fishermen.

Q9: I am a commercial fisherman but I don't use pelagic longline. Will these regulations affect me?

A: As long as you do not have a pelagic longline on board your vessel, you will be able to fish in the closed areas. See question number 4 above for an explanation of the five elements of pelagic longline gear.

Q10: I use pelagic longline gear but do not have a limited access permit to fish for highly migratory species. Will these regulations affect me?

A: These closed areas and gear restrictions apply only to commercial fishermen who hold Federal permits for Atlantic HMS. While unpermitted vessels may fish for other species with pelagic longline gear in these areas, no tunas, swordfish, billfish, or sharks may be retained on board those vessels. However, NMFS is working with the Regional Councils to ensure consistency between regulations for all pelagic longline fisheries.

Q11: Will I need to buy a vessel monitoring system (VMS)?

A: If you are a commercial fisherman with Federal permits for Atlantic HMS and you have pelagic longline gear on board, you will need to have a VMS operational by September 1, 2000.

Q12: Can I transit the closed areas or will I need to go around them?

A: If you have pelagic longline gear on board and possess a Federal Atlantic HMS permit, you will be allowed to transit the area if your vessel has a working VMS unit, but you will not be allowed to fish with any gear type. If you have pelagic longline gear on board, it is assumed that any fish on board were caught with pelagic longline in the closed area and you will have to demonstrate that the fish were harvested outside the closed area. If you do not have pelagic longline on board, you may fish in the area.

Q13: Is there a vessel buyback program associated with this rule?

A: No. This rule does not have a buyback program associated with it. Legislation pending before Congress may address vessel buybacks.

Q14: I have the Federal swordfish, shark, and tuna limited access permits. If I decide to leave the pelagic longline fishery, can I sell my permits?

A: Yes. You can sell your limited access permits individually, as a group,

with the vessel, or without the vessel. If you have directed permits, upgrading restrictions for horsepower, length overall, and net and gross tonnage apply. For more information on transferring or renewing limited access permits, please contact the NOAA Fisheries Southeast region permit office in St. Petersburg, FL, at (727) 570-5326.

Classification

This final rule is published under the authority of the Magnuson-Stevens Act, 16 U.S.C. 1801 *et seq.*, and ATCA, 16 U.S.C. 971 *et seq.*

NMFS prepared an initial regulatory flexibility analysis for the proposed rule. Based on comments received on the proposed rule and on the IRFA (see Comments and Responses section), NMFS has amended the final actions and has revised the regulatory flexibility analysis accordingly. The final regulatory flexibility analysis FRFA assumes that fishermen, during the time they would otherwise be pelagic longline fishing in the designated areas would instead (1) make longline sets in other areas, (2) participate in other commercial fisheries, or (3) exit commercial fishing. As of March 23, 2000, 450 vessel owners had been issued for limited access permits for swordfish, sharks, and the Atlantic tunas Longline category. With these three permits, these 450 fishermen may use a pelagic longline to target Atlantic swordfish (if they have a directed swordfish permit), Atlantic tunas, or Atlantic sharks (if they have a directed shark permit). If they have an incidental swordfish or incidental shark permit, these fishermen could still target Atlantic tunas. Thus, the number of small entities directly affected by this regulation consists of at least these 450 fishermen. In addition, other sectors of the commercial fishery might be affected by this regulation, including dealers, processors, bait houses, and hook manufacturers. Using the weighout slips submitted by fishermen reporting in the pelagic longline logbook, NMFS estimates that 125 dealers received fish in 1998 from the 450 fishermen who qualified under the limited access program. NMFS also received comments that the businesses associated with the recreational and charter/headboat sectors of the HMS fisheries may also experience economic impacts as a result of the commercial fishing effort displacement which would result from the time/area closures. On balance, though, these impacts are likely to be positive as gear conflicts will be reduced in some areas and the availability of target species will increase for the recreational sector.

Under this final action, a decrease in gross revenues will result for some proportion of the affected small entities in the commercial fishing sector. Under the final time/area closure actions, NMFS estimates that, assuming the worst case scenario, the average annual gross revenues per permit holder could decrease by nearly 5 percent to about \$130,000. Additionally, NMFS estimates that under the final closure actions approximately 43 percent of the vessels that reported landings in 1998 will experience at least a 5-percent decrease in gross revenues and approximately 14 percent of the vessels will experience at least a 50-percent decrease in gross revenues (i.e., be forced out of business). The final rule closures will also have an economic impact on dealers. About 15 percent of the permitted dealers could experience at least a 5-percent reduction in the amount of fish handled due to the DeSoto Canyon area closure, while 28 percent could experience at least five percent reduction in the amount of fish handled due to the Charleston Bump and East Florida Coast closures. However, to the extent that landings of HMS are likely to increase in other areas, gains will accrue to certain other vessel operators and dealers.

Based on comments received on the proposed rule and the IRFA, NMFS has adopted a ban on live bait sets in lieu of the western Gulf of Mexico closed area. While a prohibition on live bait may reduce the landings of some pelagic longline fishermen, particularly yellowfin tuna landings, it is not likely that this final action will have a large impact on the gross revenues of any permit holder. More likely, this final action may have an impact on the net revenues of some permit holders since it will change the method of fishing. Requiring the use of frozen bait might increase costs by up to 22 percent for fishermen who currently use live bait. However, the use of dead bait might decrease the time at sea (since a number of days are used up fishing for live bait) and a decrease in the time spent at sea might decrease the cost of fuel, groceries, or the costs associated with catching the bait and keeping it alive. Thus, even though fishermen might need to spend additional money up front in order to leave for a fishing trip, this alternative might be beneficial if more sea time is available to fish for target species. In any event, the economic impacts of a live bait prohibition are expected to be less significant than under the proposed closure.

The alternatives considered include the status quo, gear modifications, and a ban on pelagic longline fishing by U.S.

vessels in the Atlantic Ocean. Although the status quo and gear modification alternatives might have lesser economic impacts on participants in the pelagic longline fishery, those alternatives either do not reduce bycatch to the extent that NMFS expects to be achieved by the time-area closures or present enforcement difficulties. While a complete ban on longline fishing would reduce bycatch to a greater extent than the time-area closures, the lost value of commercial seafood products and the adverse impacts on fishery participants and fishing communities would impose greater costs than the final action.

In addition to changes from the proposed rule, NMFS has decided to delay implementation of some of the final regulations to help mitigate some of the economic impacts fishermen may experience as a result of the time/area closures and to give fishermen and related industries a chance to relocate both business interests and families. The RIR/FRFA provides further discussion of the economic effects of the final actions and all the alternatives considered.

This final action will not impose any additional reporting or recordkeeping requirements on vessel operators or dealers. Vessel logbooks, dealer reports, observer notification, and VMS requirements applicable to the HMS fisheries are all currently approved by the Office of Management and Budget under existing regulations.

In preparing the draft HMS FMP and Billfish Amendment, NMFS initiated formal consultation for all Highly Migratory Species commercial fisheries on May 12, 1998, under section 7 of the ESA. In a BO issued on April 23, 1999, NMFS concluded that operation of the Atlantic pelagic longline fishery may adversely affect, but is not likely to jeopardize, the continued existence of any endangered or threatened species under NMFS' jurisdiction. Certain provisions of the BO were incorporated into the final rule that implemented the FMPs and consolidated the HMS regulations (e.g., moving after encounters and limiting the mainline length). Other provisions of the BO required non-regulatory programmatic actions (e.g., research and monitoring).

The Incidental Take Statement (ITS) of the April 23, 1999, BO authorized the following levels of incidental take in the pelagic longline fisheries: 690 leatherback sea turtles (*Dermochelys coriacea*), entangled or hooked (annual estimated number) of which no more than 11 are observed hooked by ingestion or moribund when released; 1541 loggerhead sea turtles (*Caretta*

caretta) entangled or hooked (annual estimated number) of which no more than 23 may be hooked by ingestion or observed moribund when released.

Observed take levels documented in 1999 indicate that, of all the turtles taken, up to 50 loggerheads and 19 leatherbacks were observed "hooked by ingestion" or moribund upon release. However, only about 3 percent observer coverage was obtained and the anticipated take levels were based on 5 percent observer coverage. Thus, the observed levels of take would likely have been considerably higher had the required 5 percent coverage level been achieved. If the target observer coverage level had been achieved, NMFS preliminarily projects that up to 83 loggerheads and 32 leatherbacks would have been observed "hooked by ingestion" or moribund in 1999.

On November 19, 1999, NMFS reinitiated consultation under Section 7 of the ESA because observed take of loggerhead sea turtles by the Atlantic pelagic longline fishery had exceeded levels anticipated in the ITS. The consultation included this pelagic longline management rulemaking because the time/area closures, if implemented, could affect the overall interaction rates with sea turtles depending on fishermen's responses in terms of shifting pelagic longline effort or fishing for other species with other gear. The consultation also addressed the shark drift gillnet fishery and the Atlantic tunas purse seine fisheries; however, the following discussion addresses only issues in the BO that apply specifically to the pelagic longline fishery which is the subject of this final rule.

After reviewing the current status of the northern right whale, the humpback, fin and sperm whales, and leatherback, loggerhead, green, hawksbill, and Kemp's ridley sea turtles, the environmental baseline for the action area, the effects of implementation of the proposed Amendment to the Atlantic HMS FMP, the record of compliance with requirements of previous BOs on HMS fisheries, and probable cumulative effects, it is NMFS' BO that continued operation of the Atlantic pelagic longline fishery is likely to jeopardize the continued existence of loggerhead and leatherback sea turtles.

According to the BO, to avoid the likelihood of jeopardizing the continued existence of loggerhead and leatherback sea turtles, NMFS must implement fishery management measures to reduce the number of these turtles that are incidentally captured, injured, killed by gear associated with federally-managed

fisheries by at least 75 percent from current levels; that is, a reduction in the number of loggerhead and leatherback sea turtles captured, injured, or killed compared with a running average of the number captured, injured, or killed during the period 1993 to 1999. The reduction can be accomplished directly by gear modifications or it can be accomplished indirectly by changing the method by which gear is deployed.

Indirect modifications could include managing fisheries that use harmful gear over time and space to eliminate the likelihood of interactions between loggerhead sea turtles and gear (proportional to the threat posed by specific gear); managing fisheries to eliminate the likelihood that loggerhead sea turtles captured by gear would drown before they can be released (such as keeping soak times to less than 30 to 45 minutes); excluding gear from areas that, based on available data, appear to be important for loggerhead sea turtles; or, any combination of these changes that reduce the number of loggerhead sea turtles that are incidentally captured, injured, and killed by gear associated with federally-managed fisheries by at least 75 percent from current levels.

The BO identified the Reasonable and Prudent Alternatives (RPAs) necessary to avoid jeopardy, and listed the Reasonable and Prudent Measures (RPMs) and Terms and Conditions (TCs) necessary to authorized continued takes. According to the BO, if NMFS cannot develop and implement direct or indirect management measures that reduce the number of loggerhead sea turtles that are incidentally captured, injured, and killed by gear associated with federally managed fisheries by at least 75 percent from current levels, the following RPAs must be implemented: modifications in fishing gear or method (e.g., requirement for corrodible hooks or limiting fishing activity to certain temperature and time of day regimes); or exclusion zones (e.g., temporally and spatially restricting pelagic longline effort in the Grand Banks area); and enhanced monitoring.

Section 9 of ESA and Federal regulations issued pursuant to section 4(d) of ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under sections 7(b)(4) and 7(o)(2) of the ESA, taking that is incidental to and not intended as part of the Agency action is not a prohibited taking, provided that such taking is in compliance with the RPMs and TCs of

the ITS. Section 7(b)(4)(c) of the ESA specifies that in order to provide an ITS for an endangered or threatened species of marine mammal, the taking must be authorized under section 101(a)(5) of the Marine Mammal Protection Act of 1972 (MMPA). Since no incidental take has been authorized under section 101(a)(5) of the MMPA, no statement on incidental take of endangered whales is provided and no take is authorized.

Regarding anticipated incidental take of sea turtles in the pelagic longline fishery for swordfish, tunas, and sharks, it is hoped that this final rule to reduce bycatch in the pelagic longline fishery, which may slightly increase take levels of sea turtles, will be more than offset by the additional requirements to implement the RPMs according to the terms and conditions of the ITS. The BO states that the RPMs that are necessary and appropriate to minimize take of listed species include an effective monitoring and reporting system to document take, educating fishermen to reduce the potential for serious injury or mortality of hooked turtles, and assessments of current data to look for trends that may indicate management measures to reduce the number of protected species interactions.

In order to be exempt from the take prohibitions of section 9 of ESA, the June 30, 2000, BO requires NMFS to comply with certain terms and conditions which would implement the RPMs described earlier and outline required reporting/monitoring requirements. The terms and conditions are non-discretionary and require: at-sea observer coverage; information collection on the condition of sea turtles and marine mammals when released; the presence and use of dipnets and cutting devices on all longline vessels; review of turtle bycatch and release mortality studies; financial support for genetic research to identify sea turtle subpopulations; examination of the influence of gear and fishing technique modifications such as light sticks and length of mainline on protected species interaction rates.

NMFS will address the requirements of the BO in a subsequent rulemaking and by certain non-regulatory actions. In the interim, this final rule will not result in any irreversible and irretrievable commitment of resources that will have the effect of foreclosing the formulation or implementation of any RPAs necessary to reduce impacts on protected species.

This final rule has been determined to be not significant for purposes of E.O. 12866.

List of Subjects in 50 CFR Part 635

Fisheries, Fishing, Fishing vessels, Foreign relations, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Statistics, Treaties.

Dated: July 26, 2000.

Penelope D. Dalton,

*Assistant Administrator for Fisheries,
National Marine Fisheries Service.*

For the reasons set out in the preamble, 50 CFR part 635, is amended as follows:

PART 635—ATLANTIC HIGHLY MIGRATORY SPECIES

1. The authority citation for part 635 continues to read as follows:

Authority: 16 U.S.C. 971 *et seq.*; 16 U.S.C. 1801 *et seq.*

2. In § 635.2, the definition of "High-flyer" is revised and new definitions for "Charleston Bump closed area," "DeSoto Canyon closed area," "East Florida Coast closed area," "Handline," "Longline," and "Pelagic longline" are added in alphabetical order to read as follows:

§ 635.2 Definitions.

Charleston Bump closed area means the Atlantic Ocean area seaward of the baseline from which the territorial sea is measured from a point intersecting the U.S. coast at 34°00' N. lat. near Wilmington Beach, North Carolina, and proceeding due east to connect by straight lines the following coordinates in the order stated: 34°00' N. lat., 76°00' W. long.; 31°00' N. lat., 76°00' W. long.; then proceeding due west to intersect the coast at 31°00' N. lat. near Jekyll Island, Georgia.

DeSoto Canyon closed area means the area within the Gulf of Mexico bounded by straight lines connecting the following coordinates in the order stated: 30°00' N. lat., 88°00' W. long.; 30°00' N. lat., 86°00' W. long.; 28°00' N. lat., 86°00' W. long.; 28°00' N. lat., 84°00' W. long.; 26°00' N. lat., 84°00' W. long.; 26°00' N. lat., 86°00' W. long.; 28°00' N. lat., 86°00' W. long.; 28°00' N. lat., 88°00' W. long.; 30°00' N. lat., 88°00' W. long.

East Florida Coast closed area means the Atlantic Ocean area seaward of the baseline from which the territorial sea is measured from a point intersecting the U.S. coast at 31°00' N. lat. near Jekyll Island, Georgia, and proceeding due east to connect by straight lines the following coordinates in the order

stated: 31°00' N. lat., 78°00' W. long.; 28°17' N. lat., 79°00' W. long.; then proceeding along the boundary of the EEZ to 24°00' N. lat., 79°30' W. long.; then connecting by straight lines the following coordinates in the order stated: 24°00' N. lat., 79°30' W. long.; 24°00' N. lat., 81°00' W. long.; 24°00' N. lat., 81°47' W. long.; then proceeding due north to intersect the coast at 81°47' W. long. near Key West, Florida.

* * * * *

Handline means fishing gear that consists of a mainline to which no more than two leaders (gangions) with hooks are attached, and that is released and retrieved by hand, rather than by mechanical means.

High-flyer means a flag, radar reflector or radio beacon transmitter, suitable for attachment to a longline to facilitate its location and retrieval.

* * * * *

Longline means fishing gear that is set horizontally, either anchored, floating, or attached to a vessel, and that consists of a mainline or groundline with three or more leaders (gangions) and hooks, whether retrieved by hand or mechanical means.

* * * * *

Pelagic longline means a longline that is suspended by floats in the water column and that is not fixed to or in contact with the ocean bottom.

* * * * *

3. In § 635.4, paragraph (a)(10) is added, and paragraph (e)(4) is removed, to read as follows:

§ 635.4 Permits and fees.

* * * * *

(a) * * *

(10) *Permit condition.* An owner issued a swordfish or shark permit pursuant to this part must agree, as a condition of such permit, that the vessel's swordfish or shark fishing, catch and gear are subject to the requirements of this part during the period of validity of the permit, without regard to whether such fishing occurs in the EEZ, or outside the EEZ, and

without regard to where such swordfish or shark, or gear are possessed, taken or landed. However, when a vessel fishes within the waters of a state that has more restrictive regulations on swordfish or shark fishing, persons aboard the vessel must abide by the state's more restrictive regulations.

* * * * *

4. In § 635.21, paragraph (c) introductory paragraph and paragraph (c)(2) are revised, and paragraph (c)(4) is added to read as follows:

§ 635.21 Gear operation and deployment restrictions.

* * * * *

(c) *Pelagic longlines.* For purposes of this part, a vessel is considered to have pelagic longline gear on board when a power-operated longline hauler, a mainline, high-flyers, floats capable of supporting the mainline, and leaders (gangions) with hooks are on board. Removal of any one of these elements constitutes removal of pelagic longline gear. If a vessel issued a permit under this part is in a closed area designated under paragraph (c)(2) of this section with pelagic longline gear on board, it is a rebuttable presumption that fish on board such vessel were taken with pelagic longline gear in the closed area.

* * * * *

(2) If pelagic longline gear is on board a vessel issued a permit under this part, persons aboard that vessel may not fish or deploy any type of fishing gear in:

(i) The Northeastern United States closed area from June 1 through June 30 each calendar year;

(ii) In the Charleston Bump closed area from February 1 through April 30 each calendar year;

(iii) In the Florida East Coast closed area at any time beginning at 12:01 a.m. on February 1, 2001; and,

(iv) In the DeSoto Canyon closed area at any time beginning at 12:01 a.m. on November 1, 2000.

* * * * *

(4) In the Gulf of Mexico: pelagic longline gear may not be fished or

deployed from a vessel issued a permit under this part with live bait affixed to the hooks; and, a person aboard a vessel issued a permit under this part that has pelagic longline gear on board shall not maintain live baitfish in any tank or well on board the vessel and shall not possess live baitfish, and shall not set up or attach an aeration or water circulation device in or to any such tank or well. For the purposes of this section, the Gulf of Mexico includes all waters of the U.S. EEZ west and north of the boundary stipulated at 50 CFR 600.105(c).

* * * * *

5. In § 635.69, paragraph (a) is revised by adding a second sentence to read as follows:

§ 635.69 Vessel monitoring systems.

(a) *Applicability.* * * * A vessel is considered to have pelagic longline gear on board for the purposes of this section, when gear as specified at § 635.21(c) is on board.

* * * * *

6. In § 635.71, paragraphs (a)(30), (31), and (32) are added to read as follows:

§ 635.71 Prohibitions.

* * * * *

(a) * * *

(30) Deploy or fish with a pelagic longline greater than the maximum length authorized for any area specified at § 635.21(c)(1).

(31) Deploy or fish with any fishing gear from a vessel with a pelagic longline on board in any closed area during the time periods specified at § 635.21(c)(2).

(32) In the Gulf of Mexico, deploy or fish a pelagic longline with live bait affixed to the hooks or to possess live bait, or set up a well or tank to maintain live bait, aboard a vessel with pelagic longline gear on board as specified at § 635.21(c)(4).

* * * * *

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coordinator. However, in the event that the interference contour of a proposed station would overlap the service contour of an existing station licensed on one of these previously shared frequencies, the written concurrence of the coordinator associated with the industry for which the existing station license was issued, or the written concurrence of the licensee of the existing station, shall be obtained. For the purposes of this § 90.35, the service contour for UHF stations is the 39 dBu contour; and the interference contour for UHF stations is the 21 dBu contour; the service contour for VHF stations is the 37 dBu contour; and the interference contour for VHF stations is the 19 dBu contour.

* * * * *

3. Section 90.175 is amended by revising paragraphs (b)(1), (b)(2), and (b)(3) to read as follows:

§ 90.175 Frequency coordination requirements.

* * * * *

(b) * * *

(1) A statement is required from the applicable frequency coordinator as specified in §§ 90.20(c)(2) and 90.35(b) recommending the most appropriate frequency. In addition, if the interference contour of a proposed station would overlap the service contour of a station on a frequency formerly shared prior to radio service consolidation by licensees in the Manufacturers Radio Service, the Forest Products Radio Service, the Power Radio Service, the Petroleum Radio Service, the Motor Carrier Radio Service, the Railroad Radio Service or the Automobile Emergency Radio Service, the written concurrence of the coordinator for the industry-specific service, or the written concurrence of the licensee itself, must be obtained. Requests for concurrence must be responded to within 20 days of receipt of the request. The written request for concurrence shall advise the receiving party of the maximum 20 day response period. The coordinator's recommendation may include comments on technical factors such as power, antenna height and gain, terrain and other factors which may serve to minimize potential interference. In addition:

(2) On frequencies designated for coordination or concurrence by a specific frequency coordinator as specified in §§ 90.20(c)(3) and 90.35(b), the applicable frequency coordinator shall provide a written supporting statement in instances in which coordination or concurrence is denied. The supporting statement shall contain

sufficient detail to permit discernment of the technical basis for the denial of concurrence. Concurrence may be denied only when a grant of the underlying application would have a demonstrable, material, adverse effect on safety.

(3) In instances in which a frequency coordinator determines that an applicant's requested frequency or the most appropriate frequency is one designated for coordination or concurrence by a specific frequency coordinator as specified in §§ 90.20(c)(3) or 90.35(b), that frequency coordinator may forward the application directly to the appropriate frequency coordinator. A frequency coordinator may only forward an application as specified above if consent is received from the applicant.

[FR Doc. 01-2870 Filed 2-2-01; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 635

[Docket No. 991210332-0212-02; I.D. 122700B]

RIN 0648-AO95

Atlantic Highly Migratory Species (HMS) Fisheries; Regulatory Adjustments

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule; technical amendment.

SUMMARY: NMFS amends the final regulations governing the Atlantic HMS fisheries to clarify the annual quota for blue sharks, to revise a cross-reference for shark size limits, and to revise the specifications for the East Florida Coast and Charleston Bump closed areas as intended by the recent final rule to minimize bycatch and incidental catch in the pelagic longline fishery.

DATES: Effective January 31, 2001.

FOR FURTHER INFORMATION CONTACT: Karyl Brewster-Geisz at 301-713-2347, FAX: 301-713-1917.

SUPPLEMENTARY INFORMATION: On May 28, 1999, NMFS published a final rule (64 FR 29090) that implemented, among other things, the Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan (HMS FMP), which was adopted by the agency in April

1999. The final consolidated rule included language specifying the semiannual blue shark quota but inadvertently omitted language specifying the annual blue shark quota. The final consolidated rule also incorrectly cross-referenced the shark minimum size limit that is specified in the HMS FMP.

Additionally, on August 1, 2000, NMFS published a final rule (65 FR 47214) that prohibited pelagic longline fishing at certain times and in certain areas within the Exclusive Economic Zone (EEZ) of the Atlantic Ocean off the coast of the Southeastern United States and in the Gulf of Mexico. In that final rule, the definitions for the East Florida Coast and Charleston Bump closed areas inadvertently specified parts of the Atlantic Ocean outside the U.S. EEZ. As noted throughout the record for the final rule, the agency intended the restrictions to apply only in the U.S. EEZ. This technical amendment corrects these errors in the regulatory text and does not change the intent of the final rule. Due to the respecification of the referenced closed areas and the need for NMFS to distribute this information to affected fishermen and State and Federal enforcement personnel, NMFS postpones initiation of those time/area closures until March 1, 2001.

Classification

The Assistant Administrator for Fisheries (AA), under 5 U.S.C. 553(b)(B), finds that providing prior notice and opportunity for public comment on this final rule is unnecessary and contrary to the public interest. This final rule corrects earlier rules by clarifying regulatory text inconsistent with the final HMS FMP and the Final Supplemental Environmental Impact Statement for the regulatory amendment reducing bycatch, bycatch mortality, and incidental catch in the Atlantic pelagic longline fishery. These corrections and clarifications are necessary to avoid adverse impacts on fishery participants that would result from inconsistent interpretations of the regulations relative to these regulations and/or the inability of NMFS to enforce regulations due to lack of clarity. For similar reasons, the AA, under 5 U.S.C. 553(d)(3), finds that delaying the effective date of this final rule for 30 days is unnecessary and contrary to the public interest.

Because prior notice and opportunity for public comment are not required for this rule by 5 U.S.C. 553, or by any other law, the analytical requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, are inapplicable. This action is

not significant under the meaning of Executive Order 12866.

List of Subjects in 50 CFR Part 635

Fisheries, Fishing, Fishing vessels, Foreign relations, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Statistics, Treaties.

Dated: January 30, 2001

William T. Hogarth,

Acting Assistant Administrator for Fisheries,
National Marine Fisheries Service.

For the reasons set out in the preamble, 50 CFR part 635 is amended as follows:

PART 635—ATLANTIC HIGHLY MIGRATORY SPECIES

1. The authority citation for part 635 continues to read as follows:

Authority: 16 U.S.C. 971 *et seq.*; 16 U.S.C. 1801 *et seq.*

2. In § 635.2, the definitions of “Charleston Bump closed area” and “East Florida Coast closed area” are revised to read as follows:

§ 635.2 Definitions.

* * * * *

Charleston Bump closed area means the Atlantic Ocean area seaward of the inner boundary of the U.S. EEZ from a point intersecting the inner boundary of the U.S. EEZ at 34°00' N. lat. near Wilmington Beach, NC, and proceeding due east to connect by straight lines the following coordinates in the order stated: 34°00' N. lat., 76°00' W. long.; 31°00' N. lat., 76°00' W. long.; then proceeding due west to intersect the inner boundary of the U.S. EEZ at 31°00' N. lat. near Jekyll Island, GA.

* * * * *

East Florida Coast closed area means the Atlantic Ocean area seaward of the inner boundary of the U.S. EEZ from a point intersecting the inner boundary of the U.S. EEZ at 31°00' N. lat. near Jekyll Island, GA, and proceeding due east to connect by straight lines the following coordinates in the order stated: 31°00' N. lat., 78°00' W. long.; 28°17' N. lat., 79°12' W. long.; then proceeding along the outer boundary of the EEZ to the intersection of the EEZ with 24°00' N. lat.; then proceeding due west to the following coordinates: 24°00' N. lat., 81°47' W. long.; then proceeding due north to intersect the inner boundary of the U.S. EEZ at 81°47' W. long. near Key West, FL.

* * * * *

3. In § 635.21, paragraphs (c)(2)(ii) and (iii) are revised to read as follows:

§ 635.21 Gear operation and deployment restrictions.

* * * * *

(c) * * *

(2) * * *

(ii) In the Charleston Bump closed area from March 1 through April 30, 2001, and from February 1 through April 30 each calendar year thereafter;

(iii) In the East Florida Coast closed area at any time beginning at 12:01 a.m. on March 1, 2001; and

* * * * *

4. In § 635.22, the first sentence of paragraph (c) is revised to read as follows:

§ 635.22 Recreational retention limits.

* * * * *

(c) *Sharks*. One shark from either the large coastal, small coastal or pelagic group may be retained per vessel per trip, subject to the size limits described in § 635.20(e), and, in addition, one Atlantic sharpnose shark may be retained per person per trip. * * *

* * * * *

5. In § 635.27, paragraph (b)(1)(iii) is revised to read as follows:

§ 635.27 Quotas.

* * * * *

(b) * * *

(1) * * *

(iii) *Pelagic sharks*. The annual commercial quotas for pelagic sharks are 92 mt dw for porbeagle sharks, 273 mt dw for blue sharks, and 488 mt dw for pelagic sharks other than porbeagle or blue sharks (unless otherwise specified in the **Federal Register** as provided in paragraph (b)(1)(iv) of this section). These quotas are divided between two semiannual periods, January 1 through June 30, and July 1 through December 31. The quotas for each semiannual period are as follows:

(A) Porbeagle shark—46 mt dw.

(B) Blue sharks—136.5 mt dw.

(C) Pelagic sharks, other than porbeagle or blue sharks—244 mt dw.

* * * * *

[FR Doc. 01–2957 Filed 1–31–01; 3:33 pm]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

[Docket No. 991228355-0370-04; I.D. 101200F]

RIN 0648-AM50

Fisheries of the Northeastern United States; 2001 Fishing Quotas for Atlantic Surf Clams, Ocean Quahogs, and Maine Mahogany Ocean Quahogs

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule; 2001 fishing quotas for Atlantic surf clams, ocean quahogs, and Maine mahogany ocean quahogs.

SUMMARY: NMFS issues final quotas for the Atlantic surf clam, ocean quahog, and Maine mahogany ocean quahog fisheries for 2001. The intent of this action is to specify allowable harvest levels of Atlantic surf clams and ocean quahogs from the exclusive economic zone and an allowable harvest level of Maine mahogany ocean quahogs from the waters north of 43°50'N. lat. in 2001. **DATES:** Effective from February 5, 2001, through December 31, 2001.

ADDRESSES: Send comments on any ambiguity or unnecessary complexity arising from the language used in this final rule to Patricia A. Kurkul, Regional Administrator, Northeast Region, National Marine Fisheries Service, One Blackburn Drive, Gloucester, MA 01930-2298. Copies of supporting documents, including the Environmental Assessment, Regulatory Impact Review, Final Regulatory Flexibility Analysis (EA/RIR/FRFA), and the Essential Fish Habitat Assessment, are available from the Regional Administrator, Northeast Region. The EA/RIR/FRFA is accessible via the Internet at <http://www.nero.gov/ro/doc/nr.htm>.

FOR FURTHER INFORMATION CONTACT: Jennifer L. Anderson, Fishery Management Specialist, 978-281-9226.

SUPPLEMENTARY INFORMATION: The Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fisheries (FMP) directs NMFS, in consultation with the Mid-Atlantic Fishery Management Council (Council), to specify quotas for surf clams and ocean quahogs on an annual basis from a range that represents the optimum yield (OY) for each fishery. It is the policy of the Council that the levels selected allow fishing to continue at that level for at least 10 years for surf clams

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Appendix E. List of fishes collected or observed in association with pelagic *Sargassum* in the North Atlantic Ocean including the Gulf of Mexico and Caribbean Sea. Life-stages are E=egg, L=larva, J=juvenile and A=adult. Nomenclature follows Robins et al. (1991) (Source: NMFS 1997).).

Family	Genus and species	Common name	Life-stage(s)
Carcharhinidae		requiem sharks	
	<i>Carcharhinus falciformis</i>	silky shark	A
	<i>C. limbatus</i>	blacktip shark	A
	<i>C. longimanus</i>	oceanic whitetip shark	A
Muraenidae		morays	
	Unidentified	moray	L
Clupeidae		herrings	
	<i>Sardinella aurita</i>	Spanish sardine	J
Gonostomatidae		lightfishes	
	Unidentified	lightfish	L
Myctophidae		lanternfishes	
	Unidentified	lanternfish	L
Gadidae		cods	
	<i>Urophycis chuss</i>	red hake	L, J
	<i>U. earlli</i>	Carolina hake	L, J
	<i>U. floridana</i>	southern hake	L, J
	<i>U. regia</i>	spotted hake	L, J
Antennariidae		frogfishes	
	<i>Histrio histrio</i>	sargassumfish	L, J, A
Exocoetidae		flyingsharks	
	<i>Cypselurus furcatus</i>	spotfin flyingfish	E, L, J, A
	<i>C. melanurus</i>	Atlantic flyingfish	E, L, J, A
	<i>Exocoetus obtusirostris</i>	oceanic two-wing flyingfish	J
	<i>Hemirhamphus balao</i>	balao	J
	<i>H. brasiliensis</i>	ballyhoo	J
	<i>Hirundichthys affinis</i>	fourwing flyingfish	E, L, J, A
	<i>Hyporhamphus unifasciatus</i>	silverstripe halfbeak	L, J
	<i>Paraexocoetus brachypterus</i>	sailfin flyingfish	E, L, J, A
	<i>Prognichthys gibbifrons</i>	bluntnose flyingfish	E, L, J, A
Belontiidae		needlefishes	
	<i>Tylosurus acus</i>	agujon	L, J
Fistulariidae		cornetfishes	
	<i>Fistularia tabacaria</i>	bluespotted cornetfish	J
Centriscidae		snipefishes	
	<i>Macroramphosus scolopax</i>	longspine snipefish	J
Syngnathidae		pipefishes	
	<i>Hippocampus erectus</i>	lined seahorse	J
	<i>H. reidi</i>	longsnout seahorse	J
	<i>Microphis brachyurus</i>	opossum pipefish	J
	<i>Syngnathus caribbaeus</i>	Caribbean pipefish	J
	<i>S. floridae</i>	dusky pipefish	J
	<i>S. fuscus</i>	northern pipefish	J
	<i>S. louisianae</i>	chain pipefish	J
	<i>S. pelagicus</i>	sargassum pipefish	E, L, J, A
	<i>S. scovelli</i>	gulf pipefish	J
	<i>S. springeri</i>	bull pipefish	J

Table 17(Cont.). List of fishes collected or observed in association with pelagic *Sargassum* in the North Atlantic Ocean including the Gulf of Mexico and Caribbean Sea.

Family	Genus and species	Common name	Life-stage(s)
Dactylopteridae		flying gurnards	
	<i>Dactylopterus volitans</i>	flying gurnard	L, J
Scorpaenidae		scorpionfishes	
	Unidentified	scorpionfish	L
Serranidae		sea basses	
	<i>Epinephelus inermis</i>	marbled grouper	J
Priacanthidae		bigeyes	
	<i>Priacanthus arenatus</i>	bigeye	J
	<i>Pristigeyys alta</i>	short bigeye	L, J
Apogonidae		cardinalfishes	
	<i>Apogon maculatus</i>	flamefish	L
Pomatomidae		bluefish	
	<i>Pomatomus saltatrix</i>	bluefish	L
Rachycentridae		cobias	
	<i>Rachycentron canadum</i>	cobia	E, L, J, A
Echeneidae		remoras	
	<i>Phtheichthys lineatus</i>	slender suckerfish	J
Carangidae		jacks	
	<i>Caranx bartholomaei</i>	yellow jack	L, J
	<i>C. crysos</i>	blue runner	L, J
	<i>C. dentex</i>	white trevally	J
	<i>C. hippos</i>	crevalle jack	J
	<i>C. latus</i>	horse-eye jack	J
	<i>C. ruber</i>	bar jack	L, J
	<i>Chloroscombrus chrysurus</i>	Atlantic bumper	L, J
	<i>Decapterus macerellus</i>	mackerek scad	J
	<i>D. punctatus</i>	round scad	J
	<i>D. tabl</i>	redtail scad	J
	<i>Elagatis bipinnulata</i>	rainbow runner	L, J, A
	<i>Naucrates ductor</i>	pilotfish	J
	<i>Selar crumenophthalmus</i>	bigeye scad	L, J
<i>Selene vomer</i>		lookdown	J
	<i>Seriola dumerili</i>	greater amberjack	L, J
	<i>S. fasciata</i>	lesser amberjack	J
	<i>S. rivoliana</i>	almaco jack	L, J, A
	<i>S. zonata</i>	banded rudderfish	J
	<i>Trachinotus falcatus</i>	permit	L, J
	<i>T. goodei</i>	palometa	J
	<i>Trachurus lathami</i>	rough scad	L, J
Coryphaenidae		dophins	
	<i>Coryphaena equisetis</i>	pompano dolphin	L, J, A
	<i>C. hippurus</i>	dolphin	L, J, A
Lutjanidae		snappers	
	<i>Lutjanus</i> sp.	snapper	L
	<i>Rhomboplites aurorubens</i>	vermillion snapper	L, J
Lobotidae		tripletails	
	<i>Lobotes surinamensis</i>	tripletail	L, J, A
Gerreidae		mojarras	
	<i>Eucinostomus</i> sp.	mojarra	L

Table 17(Cont.). List of fishes collected or observed in association with pelagic *Sargassum* in the North Atlantic Ocean including the Gulf of Mexico and Caribbean Sea.

Family	Genus and species	Common name	Life-stage(s)
Sparidae		porgies	
	<i>Pagrus pagrus</i>	red porgy	L, J
Mullidae		goatfishes	
	<i>Mullus auratus</i>	red goatfish	L, J
	Unidentified	goatfish	L
Kyphosidae		sea chubs	
	<i>Kyphosus incisor</i>	yellow chub	L, J
	<i>K. sectatrix</i>	Bermuda chub	L, J
Chaetodontidae		butterflyfishes	
	<i>Chaetodon ocellatus</i>	spotfin butterflyfish	J
	<i>C. striatus</i>	banded butterflyfish	J
Pomacentridae		damselfishes	
	<i>Abudefduf saxatilis</i>	sergeant major	L, J
Mugilidae		mullet	
	<i>Mugil cephalus</i>	striped mullet	L
	<i>M. curema</i>	white mullet	L
Sphyraenidae		barracudas	
	<i>Sphyraena barracuda</i>	great barracuda	A
	<i>S. borealis</i>	northern sennet	L, J
Polynemidae		threadfins	
	<i>Polydactylus virginicus</i>	barbu	J
Labridae		wrasses	
	<i>Bodianus pulchellus</i>	spotfin hogfish	J
	<i>Thalassoma bifasciatum</i>	bluehead	J
Scaridae		parrotfishes	
	Unidentified	parrotfish	L
Uranoscopidae		stargazers	
	Unidentified	stargazer	L
Blenniidae		combtooth blennies	
	<i>Hypsoblennius hentzi</i>	feather blenny	L
	<i>Parablennius marmoreus</i>	seaweed blenny	L
Gobiidae		gobies	
	<i>Microgobius</i> sp.	goby	L
Acanthuridae		surgeonfishes	
	<i>Acanthurus randalli</i>	gulf surgeonfish	J
	<i>Acanthurus</i> sp.	surgeonfish	L
Trichiuridae		snake mackerels	
	Unidentified	snake mackerel	L
Scombridae		mackerels	
	<i>Acanthocybium solandri</i>	wahoo	J, A
	<i>Auxis thazard</i>	frigate mackerel	J, A
	<i>Euthynnus alletteratus</i>	little tunny	A
	<i>Katsuwonus pelamis</i>	skipjack tuna	A
	<i>Scomber japonicus</i>	chub mackerel	J
	<i>Scomberomorus cavalla</i>	king mackerel	A
	<i>Thunnus albacares</i>	yellowfin tuna	J, A
	<i>T. atlanticus</i>	blackfin tuna	A
Xiphiidae		swordfishes	
	<i>Xiphius gladius</i>	swordfish	L, J

Table 17 (Cont.). List of fishes collected or observed in association with pelagic *Sargassum* in the North Atlantic Ocean including the Gulf of Mexico and Caribbean Sea.

Family	Genus and species	Common name	Life-stage(s)
Istiophoridae		billfishes	
	<i>Istiophorus platypterus</i>	sailfish	L, J
	<i>Makaira nigricans</i>	blue marlin	L, J, A
	<i>Tetrapturus albidus</i>	white marlin	L, J, A
Stromateidae		butterfishes	
	<i>Ariomma</i> sp.	driftfish	L
	<i>Centrolophus</i> sp.	ruff	J
	<i>Cubiceps pauciradiatus</i>	bigeye cigarfish	J
	<i>Hyperoglyphe bythites</i>	black driftfish	J
	<i>H. perciformis</i>	barrelfish	J
	<i>Peprilus triacanthus</i>	butterfish	L, J
	<i>Psenes cyanophrys</i>	freckled driftfish	J
Bothidae		lefteye flounders	
	<i>Bothus</i> sp.	flounder	L
	<i>Cyclopsetta fimbriata</i>	spotfin flounder	L
Balistidae		leatherjackets	
	<i>Aluterus heudeloti</i>	dotterel filefish	L, J
	<i>A. monoceros</i>	unicorn filefish	L, J
	<i>A. schoepfi</i>	orange filefish	L, J
	<i>A. scriptus</i>	scrawled filefish	L, J
	<i>Balistes capricornus</i>	gray triggerfish	J, A
	<i>B. vetula</i>	queen triggerfish	J
	<i>Cantherhines macrocerus</i>	whitespotted filefish	J
	<i>C. pullus</i>	orangespotted filefish	J, A
	<i>Canthidermis maculata</i>	rough triggerfish	J
	<i>C. sufflamen</i>	ocean triggerfish	J
	<i>Monacanthus ciliatus</i>	fringed filefish	J
	<i>M. hispidus</i>	planehead filefish	J
	<i>M. setifer</i>	pygmy filefish	J
	<i>M. tuckeri</i>	slender filefish	J
	<i>Xanthichthys ringens</i>	sargassum triggerfish	J
Ostraciidae		boxfishes	
	<i>Lactophrys</i> sp.	cowfish	L
Tetraodontidae		puffers	
	<i>Chilomycterus antennatus</i>	bridled burrfish	J
	<i>C. schoepfi</i>	striped burrfish	J
	<i>Diodon holocanthus</i>	ballonfish	J
	<i>D. hystrix</i>	porcupinefish	J
	<i>Sphoeroides maculatus</i>	northern puffer	L
	<i>S. spengleri</i>	bandtail puffer	L
Unidentified		puffer	L
Molidae		molasses	
	<i>Mola</i> sp.	mola	J

Appendix F. Biological Evaluation for Actions Proposed to Conserve and Manage Dolphin and Wahoo in the United States Atlantic Exclusive Economic Zone (EEZ).

Biological Evaluation

Proposed actions to conserve and manage common dolphin, *Coryphaena hippurus*, pompano dolphin, *Coryphaena equiselis*, and wahoo, *Acanthocybium solandri*, in the United States Atlantic Exclusive Economic Zone (EEZ).

In recent years, landings of dolphin and wahoo from the Atlantic EEZ have increased. This increase is thought to have resulted from the commercial longline fishery redirecting a portion of their effort from other directed fisheries due to closures and from the recreational fishery, particularly the charterboat sector. Though both dolphin and wahoo grow rapidly and mature early, the New England, Mid-Atlantic and South Atlantic Fishery Management Councils are concerned that these recent increases in landings could result in localized depletion of stocks and a shift in the historical levels of catch between commercial and recreational fishermen.

Historically, dolphin/wahoo has been considered a recreational fishery, so concerns were raised when commercial landings in the Atlantic began to increase. Traditional longliners, originally targeting species such as shark, tuna and swordfish, were known to be modifying their fishing practices to include dolphin/wahoo as a greater portion of their longline trips. Longliners have indicated that their shift in effort was due to early closures in those other fisheries. Considering further regulations within the highly migratory species (HMS) fishery, the future of the longliners participation in the dolphin fishery is unknown though it may mean continued shifts in effort. With this increase in landings and the potential for effort expansion into nearshore coastal waters to target dolphin, conflicts over the allocation of resources between recreational and commercial fishermen may continue to occur. Further, these shifts in effort in the commercial fishery, dependant upon the magnitude, could result in localized depletion in abundance.

To address these issues of concern, the Atlantic Fishery Councils jointly developed a fishery management plan (FMP) for dolphin/wahoo. Due to the importance of the dolphin/wahoo fishery to the recreational fishing community in the Atlantic, the overall goal of the South Atlantic, Mid-Atlantic, and New England Councils is to initially adopt precautionary management strategies that attempt to maintain the current harvest level and historical allocations of dolphin and ensure that no new fisheries develop. This will require that current catch levels not be exceeded and that existing conflicts between sectors of the fishery (i.e. commercial longliners and recreational fishermen) be resolved. The status quo is intended to reflect trends in the fishery (average catch and effort levels) observed over recent years.

Currently, there are no federal regulations in place to manage this fishery however, several states have implemented size and bag limits for the dolphin fishery. North Carolina has implemented a daily bag limit of 10 per person with no minimum size and limits charter vessels to 60 per trip. South Carolina has a daily bag limit of 7 per person or 26 per boat, whichever is less, and a commercial trip limit of 4,500 pounds. The commercial quota for South Carolina is 180,000 pounds. Georgia has a 20-inch fork length minimum and a 10 per person daily recreational bag limit that is not to exceed 60 per boat except for headboats certified to allow 10 fish per paying customer. Florida has a 10 per person daily recreational bag limit with a 20-inch fork length minimum size for the commercial fishery only.

In this evaluation, the term dolphin includes both the common and pompano species.

Objectives

Listed below are the objectives addressed by this FMP.

- (1) Address localized reduction in fish abundance. The Councils remain concerned over the potential shift of effort by longline vessels to traditional recreational fishing grounds and the resulting reduction in local availability if commercial harvest intensifies.
- (2) Minimize market disruption. Commercial markets (mainly local) may be disrupted if large quantities of dolphin are landed from intense commercial harvest or unregulated catch and landings by components of the recreational sector.
- (3) Minimize conflict and/or competition between recreational and commercial user groups. If commercial longlining effort increases either directing on dolphin and wahoo or targeting these species as a significant bycatch, conflict and/or competition may arise if effort shifts to areas traditionally used by recreational fishermen.
- (4) Optimize the social and economic benefits of the dolphin fishery. Given the significant importance of dolphin and wahoo to the recreational sector throughout the range of these species, and management unit, manage the resources to achieve optimum yield on a continuing basis is necessary.
- (5) Reduce bycatch of the dolphin fishery. Bycatch is a problem in the pelagic longline fishery. Any increase in overall effort, and more specifically shifts of effort into nearer shore, non-traditional fishing grounds by swordfish and tuna vessels, may result in increased bycatch of non-target species. In addition, National Standard 9 requires that: "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." Therefore bycatch of the directed dolphin fishery must be addressed. Appendix C (FSEIS for HMS Regulatory Amendment 1) contains data on dolphin-wahoo pelagic longline fishery analysis. The data presented on page C-66 and in Table C-4 indicate that pelagic longlines targeting dolphin do in fact result in a bycatch of HMS species.
- (6) Direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem.
- (7) Direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries.

Action Area

The area of concern is the U.S. EEZ of the Atlantic. State waters, though not regulated by the Councils, may undergo indirect effects by the Federal fishery though what impacts transiting vessels may have most likely would not dissipate if the Federal fishery were non-existent.

Current Fisheries

The fishery for dolphin and wahoo covered by this plan is conducted along the Atlantic coast, predominantly south of Virginia into southern Florida. Wahoo are caught off North and South Carolina primarily during the spring and summer and off Florida's east coast year-round.

Commercial-Dolphin

In the Atlantic, commercial fisheries for dolphin consist primarily of longline and hook and line (which includes hand line, troll, rod and reel and electric reel). The hook and line portion of the commercial fishery is conducted similarly to the recreational hook and line segment, which is described under the recreational fisheries section. The longline component of the fishery consists of longliners that primarily target highly migratory species but may also catch dolphin and longliners that target dolphin directly.

In the mid- to late 1990s, there was an increase in longline landings of dolphin in the South Atlantic due to the participation of swordfish and shark longliners who had adapted their gear to simultaneously target dolphin. Longline vessels targeting highly migratory species have been known to catch dolphin simultaneously by attaching small leaders to their float buoys with usually only one leader per buoy with approximately 100-150 such rigs employed at one time. These rigs are retrieved at the same time as the main longline which is often set overnight (NMFS 1997 as cited in SAFMC 2001). However, based on information from the Hawaii longline fleet indicating that hooks set beneath or adjacent to floatlines have a much higher incidental take of sea turtles than hooks one or more positions away from the floatline, the following gear modifications have been required by the National Marine Fishery Service (NMFS) Emergency Rule (50 CFR Part 635). All Atlantic vessels that use longline gear and have Federal HMS limited access permits are prohibited from setting gangions within two gangion lengths of the floatline. While gear is deployed, gangions may not be attached to floatlines or to the mainline except at a distance from the attachment point of the floatline to the mainline of at least twice the length of the average gangion length in the set. In addition, to deploy gear during shallow sets the length of the gangion must be greater than the length of the floatline to ensure that a hooked or entangled turtle has sufficient slack to reach the surface and avoid drowning.

Pelagic longliners are currently prohibited from harvesting highly migratory species in the East Florida Coast Area at all times. They are also seasonally prohibited from utilizing the Charleston Bump Area from February 1 through April 30 of each year. In addition, a portion of the Northeastern Area off New Jersey is closed during June and the Northeast Distant Statistical Reporting Area (NED) closure has been extended through July 8, 2002 under NMFS Emergency Rule (50 CFR Part 635).

The directed commercial longline fishery for dolphin consists of only a few longline vessels off the coast of the Carolinas (NMFS 1997 as cited in SAFMC 2001). Approximately 8 to 12 trips per year are conducted May through July with most trips occurring during June. Vessels in the directed longline fishery for dolphin make sets during the daytime using gear that is two to six miles in length. The mainline is often 700-pound monofilament with 400-pound monofilament leaders. Typically, there are a total of 75-80 hooks per mile with a maximum of 480 hooks. The standard circle hook used for dolphin is smaller than those used for conventional longline fishing. One hook per leader is used with leaders being approximately 18 inches in length. No drop lines are used in this fishery and haul back is immediate. Gear may be set in a circular pattern to facilitate haul back

and as many as six sets may be made daily with trips averaging two days in length (NMFS 1997 as cited in SAFMC 2001). Fish are located using hook and line gear along weed lines or temperature breaks.

The 1994 through 1997 commercial landings of dolphin indicate that in the South Atlantic, hook and line accounts for the majority of catches whereas in New England and the Mid-Atlantic it is longlines (Table 1). Commercial landings data of dolphin for 1999 and 2000 are presented in Table 2 and show a similar breakdown.

Table 1. Average commercial landings of dolphin (pounds) by gear type for New England, Mid-Atlantic and South Atlantic, 1994-1997.

(Source: Goodyear 1999 as cited in SAFMC 2001)

	Hook and Line	Longline	Other/Unknown
New England	2,717	10,580	936
Mid-Atlantic	1,131	133,925	2,195
South Atlantic	992,147	429,754	9,860

Table 2. Commercial landings of dolphin (pounds) by gear type for New England, Mid-Atlantic and South Atlantic, 1999 and 2000. (Source: J. Poffenburger, NMFS pers. comm.).

	Hook and Line	Longline	Other/Unknown
New England, 1999	NA	NA	NA
New England, 2000	NA	NA	NA
Mid-Atlantic, 1999	1,853	96,599	1,053
Mid-Atlantic, 2000	1,592	32,518	1,903
S. Atlantic, 1999	647,293	238,903	58,399
S. Atlantic, 2000	520,590	294,376	113,257

Commercial-Wahoo

In the Atlantic, the commercial fishery for wahoo appears to be incidental to fishing for dolphin or other pelagic species. Averaged landings of wahoo from 1984 through 1999 for the Atlantic EEZs are presented in Table 3. Commercial landings data for wahoo by gear type for 1999 and 2000 are presented in Table 4, and show a similar breakdown to dolphin catches. The longline fishery accounts for the majority of catches in the Mid-Atlantic while hook and line account for the majority in the South Atlantic.

Table 3. Commercial landings of wahoo (pounds) averaged over 1984-1997 and 1997-1999 by region. (Source: NMFS 2000, Goodyear 1999 as cited in SAFMC 2001).

Years	South Atlantic	Mid-Atlantic	New England
Ave 1984-1997	59,151	1,840	1,391
Ave 1997-1999	87,244	3,097	52

Table 4. Commercial landings of wahoo (pounds) by gear type for New England, Mid-Atlantic and South Atlantic, 1999 and 2000. (Source: J. Poffenburger, NMFS pers. comm.).

	Hook and Line	Longline	Other/Unknown
New England, 1999	NA	NA	NA
New England, 2000	NA	NA	NA
Mid-Atlantic, 1999	159	4,248	66
Mid-Atlantic, 2000	397	1,902	826
S. Atlantic, 1999	62,652	13,190	18,813
S. Atlantic, 2000	32,359	9,925	17,614

Recreational-Dolphin

The recreational fishery in the Atlantic lands the majority of the total U.S. dolphin catch (SAMFC 1999). Much of this fishery occurs during the summer with most of the catch taken by offshore charter and private/rental vessels (SAFMC 2001). In general, private/rental vessels accounted for most recreational landings of dolphin for the Mid-Atlantic and South Atlantic regions whereas charter vessels landed more in New England (Table 5). More current data from 1998 through 2000 show a similar pattern (Table 6). Though data are scant describing the details of the recreational fishery, in general, dolphin are primarily caught by trolling live or artificial bait often near a floating object or floating material such as grass or a weedline. A common practice is to troll near a floating object and, if a fish is caught, to leave it on the line in the water to attract other dolphin. Chunks of bait are then tossed into the school and dolphin are hooked as the school comes up after the bait. Fishermen on charter vessels generally troll at a vessel speed of approximately 4.5 to 6 knots.

Table 5. Average annual recreational landings of dolphin (pounds) by mode from New England, Mid-Atlantic and South Atlantic between 1981 and 1997. (Source: Goodyear 1999 as cited in SAFMC 2001)

	Charter	Private/Rental	Headboat
New England	8,522	7,556	NA
Mid-Atlantic	173,558	222,842	NA
South Atlantic	2,127,389	4,861,402	54,155

Table 6. Recreational landings of dolphin (pounds) by mode for New England, Mid-Atlantic and South Atlantic, 1999 and 2000. (Source: J. Poffenburger, NMFS pers. comm.).

	Charter	Private/Rental	Headboat
New England, 1998	NA	NA	NA
New England, 1999	NA	1,443	NA
New England, 2000	NA	NA	NA
Mid-Atlantic, 1998	151,145	278,147	NA
Mid-Atlantic, 1999	78,632	215,847	NA
Mid-Atlantic, 2000	401	632,709	NA
S. Atlantic, 1998	4,675,713	2,567,029	21,110
S. Atlantic, 1999	3,840,009	5,940,207	49,681
S. Atlantic, 2000	4,388,095	7,553,745	NA

Recreational-wahoo

Wahoo are caught primarily by trolling. The recreational fishery for wahoo in the Atlantic mainly operates off North Carolina and the east coast of Florida (SAFMC 2001). The charter boat sector in North Carolina was responsible for landing the largest quantity of wahoo for 1994-1997 with annual average landing of 363,386 pounds (Table 32 in SAFMC 2001). The private/rental sector accounted for the majority of landings off eastern Florida during that same period with an average landing of 204,098 pounds (Table 35 in SAFMC 2001). More recent recreational landings for wahoo caught in the Atlantic are presented in Table 7.

Table 7. Recreational landings of wahoo (pounds) combined for New England, Mid-Atlantic and South Atlantic, 1998, 1999 and 2000.

(Source: J. Poffenburger, NMFS pers. comm.).

	Combined Pounds
New England, 1998	5,355
New England, 1999	NA
New England, 2000	NA
Mid-Atlantic, 1998	29,631
Mid-Atlantic, 1999	232,781
Mid-Atlantic, 2000	43,318
S. Atlantic, 1998	914,049
S. Atlantic, 1999	1,172,886
S. Atlantic, 2000*	991,559

*Does not include landings from the headboat survey.

List of Actions

Management measures for the Atlantic EEZ include:

- Action 1. The management unit is the population of dolphin (common dolphin- *Coryphaena hippurus* and pompano dolphin- *Coryphaena equiselis*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts.
- Action 2. The management unit is the population of wahoo (*Acanthocybium solandri*) from the U.S. South Atlantic, the Mid-Atlantic, and the New England coasts.
- Action 3. In the Atlantic any dealer, defined as the person who first receives dolphin or wahoo harvested in or from the EEZ by way of purchase, barter, trade, or transfer in commerce, would be required to possess a valid dealer permit issued by the National Marine Fisheries Service and to report data needed to monitor the dolphin and wahoo fisheries.

Requirements for a federal dolphin and wahoo permit are that the applicant possesses a state dealer's license and that the applicant must have a physical facility at a fixed location in the state where the dealer has a state license. A fee will be charged to cover the administrative costs of issuing the federal dolphin and wahoo permit. In addition, reporting requirements are specified in Action 6.

- Action 4. Require that the owner of a for-hire vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ.

Require that the owner of a commercial vessel obtain a vessel permit from the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ.

In order to qualify for a commercial vessel permit in the Atlantic, during one of the three calendar years preceding the control date, the vessel owner (1) must have 25 percent of his or her earned income derived from commercial or for-hire fishing, or must have earned at least \$10,000 from either commercial or for-hire fishing and (2) must be able to document 250 pounds of landings and sale of dolphin and/or wahoo on or before the control date of May 21, 1999 in the Atlantic. Alternatively individuals may also qualify for a commercial permit if they hold a valid permit in the snapper-grouper, king mackerel, or swordfish fisheries. The commercial permit is transferable (1 for 1) with the vessel when sold or replaced. Allow a 200 pound incidental harvest possession limit of dolphin and/or wahoo for vessels with a valid federal commercial permit fishing North of 39° North latitude.

For a person aboard a fishing vessel to fish for dolphin and wahoo in the exclusive economic zone (EEZ), possess dolphin and wahoo in or from the EEZ, off-load dolphin and wahoo from the EEZ, or sell dolphin and wahoo in or from the EEZ, a vessel permit for dolphin and wahoo must be issued to the vessel and be on board.

A fee will be charged to cover the administrative costs of issuing federal vessel permits. There are no requirements to qualify for a for-hire vessel permit.

- Action 5. Require that the operator of a commercial or for-hire vessel obtain an operator's permit issued by the National Marine Fisheries Service to harvest or possess dolphin or wahoo in or from the Atlantic EEZ. On each federally permitted dolphin/wahoo commercial or for-hire vessel, there must be on board at least one operator who has been issued a federal operator's permit for the dolphin/wahoo fishery. The federally permitted operator will be held accountable for violations of fishing regulations and also may be subject to a permit sanction. If an operator's permit has been sanctioned, during the permit sanction period the individual operator may not work in any capacity aboard a federally permitted fishing vessel.

No performance or competency testing will be required to obtain a permit. However, the permit may be revoked for violation of Federal dolphin and wahoo regulations as authorized by 15 C.F.R. 904.

The federal permit program will have the following requirements:

1. Any operator of a vessel fishing for dolphin or wahoo (either commercial or for-hire) must have an operator's permit issued by the NMFS Regional Administrator.
2. An operator is defined as the master or other individual on board a vessel who is in charge of that vessel (see 50 CFR 620.2).

3. The operator is required to submit an application, supplied by the Regional Administrator, for an Operator's Permit. The permit will be issued for a period of up to three years.
4. The applicant must provide his/her name, mailing address, telephone number, date of birth, and physical characteristics (height, weight, hair, and eye color) on the application. In addition to this information, the applicant must provide two passport size color photos.
5. The permit is not transferable.
6. Permit holders would be required to carry their permit aboard the fishing vessel during fishing and off-loading operations and must have it available for inspection upon request by an authorized officer.
7. The Regional Administrator may charge an administrative fee for the operator permit consistent with NOAA guidelines.

Action 6. In the Atlantic, require reporting of vessel permit holders (commercial and for-hire) and include reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP). It is the Councils' intent that existing logbook requirements continue until the cooperating partners meet to determine whether these efforts will continue under ACCSP.

Action 7. The Maximum Sustainable Yield for dolphin in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 18.8 and 46.5 million pounds. The Maximum Sustainable Yield proxy for wahoo in the Atlantic, U.S. Caribbean, and Gulf of Mexico is between 1.41 and 1.63 million pounds.

Action 8. Optimum Yield (OY) for dolphin and wahoo is the amount of harvest that can be taken by fishermen while not exceeding 75% of MSY (between 14.1 and 34.9 million pounds) for dolphin and 100% of MSY (between 1.41 and 1.63 million pounds) for wahoo.

Action 9. Overfishing Level. Overfishing is defined in terms of the NMFS Guidelines Checklist.

A maximum fishing mortality threshold (MFMT) - In the Atlantic, U.S. Caribbean, and Gulf of Mexico overfishing for dolphin and wahoo is defined as a fishing mortality rate (F) in excess of F_{MSY} ($F_{30\%Static SPR}$).

A minimum stock size threshold (MSST) – In the Atlantic, U.S. Caribbean, and Gulf of Mexico the minimum stock size threshold for dolphin and wahoo is defined as a ratio of current biomass ($B_{current}$) to biomass at MSY or $(1-M)*B_{MSY}$, where $1-M$ should never be less than 0.5. Using the best available estimates of natural mortality ($M = 0.68-0.80$) in the formula results in a MSST of 50% B_{MSY} . The stock would be overfished if current biomass ($B_{current}$) was less than MSST and would be recovered when current biomass was equal or greater than the biomass at MSY.

Action10. Establish a framework procedure for the Dolphin and Wahoo FMP to provide the South Atlantic Fishery Management Council with a mechanism to independently adjust management measures for their area of responsibility through framework action.

- Action 11. Prohibit sale of recreationally caught dolphin or wahoo in or from the Atlantic EEZ except for allowing for-hire vessels that possess the necessary state and Federal commercial permits to sell dolphin harvested under the bag limit in or from the Atlantic EEZ.
- Action 12. Establish a cap of 1.5 million pounds or 13% of total landings, whichever is greater, for the commercial fishery for dolphin. Should the catch exceed this level, the Council will review the data and evaluate the need for additional regulations which may be established through the framework.
- Action 13. Establish a recreational daily bag limit of 10 dolphin per person per day in or from the EEZ not to exceed 60 dolphin per boat per day whichever is less. Headboats (with a valid certificate of inspection) would be allowed a bag limit of 10 dolphin per paying passenger.
- Action 14. Establish a 3,000 pound trip limit for dolphin north of 31° N. Latitude and a 1,000 pound trip limit for dolphin south of 31° N. Latitude (between Jekyll Island and Little Cumberland Island, Georgia) in the EEZ southward through the SAFMC's area of jurisdiction for dolphin (landed head and tail intact) with no transfer at sea allowed.
- Action 15. Establish a minimum size limit for dolphin of 20 inches fork length off Florida and Georgia and no minimum size limit north of Georgia.
- Action 16. Establish a commercial trip limit for wahoo (landed head and tail intact) of 500 pounds with no transfer at sea allowed.
- Action 17. Do not establish a size limit for wahoo in the Atlantic EEZ.
- Action 18. Establish a recreational bag limit of 2 wahoo per person per day.
- Action 19. Specify allowable gear for dolphin and wahoo in the Atlantic EEZ as longline; hook and line gear including manual, electric, or hydraulic rod and reels; bandit gear; handline; and spearfishing gear (including powerheads).
- Action 20. Prohibit the use of surface and pelagic longline gear for dolphin and wahoo within any "time or area closure" in the South Atlantic Council's area of jurisdiction (Atlantic Coast) which is closed to the use of pelagic gear for highly migratory pelagic species.
- Action 21. Establish a fishing year of January 1 to December 31 for the dolphin and wahoo fishery in the Atlantic EEZ.
- Action 22. Expand the list of Essential Fish Habitat (EFH) definitions that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic.

EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*.

Action 23. Expand the list of Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) that were approved for dolphin by the Secretary of Commerce to apply to dolphin and wahoo throughout the Atlantic.

EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The “Wall” off of the Florida Keys; and Pelagic *Sargassum*.

Action 24. Assessment of the Impacts of Present Fishing Activities on EFH. No action to implement additional management measures to reduce impacts of fishing on dolphin wahoo EFH. Defer to measures in the *Sargassum* Fishery Management Plan, which has been submitted to the Secretary for formal review, and incorporate by reference the Comprehensive Habitat Amendment approved by the Secretary, on June 3, 1999.

Description of Listed Species and Critical Habitats Known to Occur in the Action Area

Under Section 7 of the Endangered Species Act of 1973, as amended, a review of listed species and designated critical habitat(s) known to occur in the area of proposed action(s) and potential impacts to these species and habitat(s) is required.

Marine listed species and critical habitat designations in the eastern U. S.

Endangered

Blue whale	<i>Balaenoptera musculus</i>
Humpback whale	<i>Megaptera novaeangliae</i>
Fin whale	<i>Balaenoptera physalus</i>
Northern right whale (Critical Habitat Designated)	<i>Eubalaena glacialis</i>
Sei whale	<i>Balaenoptera borealis</i>
Sperm whale	<i>Physeter macrocephalus</i>
Leatherback sea turtle	<i>Dermochelys coriacea</i>
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>
Kemp 's Ridley turtle	<i>Lepidochelys kempii</i>
Green turtle	<i>Chelonia mydas</i>
Shortnose sturgeon	<i>Acipenser brevirostrum</i>
Atlantic salmon	<i>Salmo salar</i>

Note: Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. Atlantic waters.

Threatened

Loggerhead turtle	<i>Caretta caretta</i>
Johnson's seagrass (Critical Habitat Designated)	<i>Halophila johnsonii</i>

Proposed Species

Smalltooth sawfish

Pristis pectinata

Proposed Critical Habitat

None

Candidate Species

Dusky shark

Carcharhinus obscurus

Sand Tiger Shark

Odontaspis taurus

Night Tiger

Carachahinus signatus

Atlantic sturgeon

Acipenser oxyrhynchus oxyrhynchus

Mangrove rivulus

Rivulus marmoratus

Opposum pipefish

Microphis barchyurus lineatus

Key silverside

Menidia conchorum

Goliath grouper

Epinephelus itajara

Speckled hind

Epinephelus drummondhayi

Warsaw grouper

Epinephelus nigritus

Nassau grouper

Epinephelus striatus

Species Under U.S. Fish and Wildlife Service (USFWS) Jurisdiction:

West Indian manatee

Trichechus manatus

(Critical Habitat Designated)

American crocodile

Crocodylus acutus

(Critical Habitat Designated)

Species that may be affected by the Dolphin/Wahoo fishery

Dolphin and wahoo fisheries within the action area are considered unlikely to adversely impact the following listed species due to their limited geographical range, which occur primarily or only along the coast or due to their absence from the principal area of concern: Johnson's seagrass, Shortnose sturgeon, Atlantic salmon, Smalltooth sawfish, American crocodile and the West Indian Manatee. Thus, these species will not be discussed further and the rest of the analysis will only pertain to the remaining listed species.

Sperm Whale, *Physeter macrocephalus*

Sperm whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). The primary reason for this specie's decline was commercial whaling. The International Whaling Commission (IWC) prohibited commercial hunting of sperm whales in 1981 (Reeves and Whitehead 1997 as cited in NMFS 2001).

For management purposes, the IWC recognizes four stocks of sperm whales: the North Pacific, The North Atlantic, the Northern Indian Ocean and Southern Hemisphere. However, to date, the worldwide stock structure of sperm whales remains unclear (Dufault *et al.* 1999, as cited in NMFS 2001). In the western North Atlantic, sperm whales range from Greenland to the Gulf of Mexico and the Caribbean. Their occurrence in the waters of the United States EEZ appears to be seasonal. Based on sightings data, during the winter, concentrations of sperm whales are found east and northeast of Cape Hatteras. In the spring, this concentration shifts northward to east of Delaware and Virginia as well as throughout the central portion of the mid-Atlantic Bight and southern portion of

Georges Bank. Their distribution is similar during the summer, except sperm whales are also sighted east and north of Georges Bank as well as on the continental shelf south of New England. During the fall, sperm whales continue to be abundant on the continental shelf south of New England and are found along the edge of the continental shelf in the Mid-Atlantic Bight (see CeTAP 1982; Scott and Sadove 1997). The best considered abundance estimate for sperm whales in the western North Atlantic comes from surveys covering the Gulf of St. Lawrence to Florida suggesting a population of 4,072 (CV=0.36) (Waring *et al.* 2001). Currently, the population trend for this species is undeterminable due to insufficient data.

Although it is not known for certain, sperm whales are believed to live at least 60 years (Rice 1989). Males sexually mature between the ages of 12 and 20 though they may not physically mature until about age 40. Females attain sexual maturity generally around age 9 and are regarded as physically mature at 30 (Würsig *et al.* 2000). Females birth a single calf approximately every four to seven years (Würsig *et al.* 2000). In general, females and immature whales form pods that are almost exclusively confined to warmer waters whereas the adult males can be found traveling to higher latitudes (Reeves and Whitehead 1997 as cited in NMFS 2001). Mature males return to lower latitudes during the winter to breed. Currently it is unknown whether the sperm whales found in the Gulf of Mexico undergo similar seasonal movements. Sperm whales typically prefer deep-water habitats, however, are periodically found in coastal waters (Scott and Sadove 1997). Their occurrence closer to shore is usually associated with the presence of food. Sperm whales prey primarily on large sized squid but also occasionally take octopus and a variety of fish including shark and skate (Leatherwood and Reeves 1983).

Sperm whales were hunted in America from the 17th century through the early 20th century though specific numbers of animals taken are unknown (Townsend 1935 as cited in NMFS 2001). The IWC has estimated nearly a quarter-million sperm whales were killed worldwide from commercial whaling during the 19th century alone and another 700,000 taken from the early 1900's through the early 1980's (NMFS 2001 and references therein). Since the IWC ban on commercial harvesting of sperm whales, human-induced mortality or injury does not appear to be a significant factor impacting the recovery of the species (Perry *et al.* 1999 as cited in NMFS 2001). Due to their more offshore distribution and benthic feeding habits, sperm whales seem less subject to entanglement in fishing gear than some cetacean species. Documented interactions have primarily involved offshore fisheries such as pelagic drift gillnets and longling fisheries, though no interactions between sperm whales and longlines have been recorded in the U.S. Atlantic. (In January 1999, NMFS issued a Final Rule to prohibit the use of driftnets in the North Atlantic swordfish fishery, 50 CFR Part 630). Overall, the fishery-related mortality or serious injury for the western North Atlantic stock is considered to be less than 10% of the Potential Biological Removal level (PBR). PBR is a calculation required under the MMPA which estimates the number of animals that can be removed annually from the population or stock (in addition to natural mortality) while allowing that stock to remain at an optimum sustainable population level (OSP). The estimated PBR for the western North Atlantic sperm whale is 7.0 and 0.8 for the Gulf of Mexico stock (Waring *et al.* 2001). Other impacts known to kill or injury sperm whales include ship strikes and ingestion of foreign material (i.e. fishing line, plastics).

Blue Whale, *Balaenoptera musculus*

Blue whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected by the Marine Mammal Protection Act of 1972 (MMPA). Modern whaling severely depleted the world's stocks of blue whales decreasing their population to only a small fraction of what it was thought to be in the early 20th century. Blue whales were given complete protection in the North Atlantic in 1955 under the International Convention for the Regulation of Whaling though Iceland did not recognize their protected status until 1960 (Sigurjónsson 1988).

Blue whales are the largest of the baleen whales, which instead of teeth, use a series of plates rooted in the upper jaw (made of material similar to that of finger-nails) to strain food from the water. As with most baleen whales, it is thought that blue whales undertake seasonal north/south movements, with summers spent in higher latitudes feeding and winters in lower latitudes, possibly breeding or calving. In the western North Atlantic, blue whales range from the Arctic to the mid-latitudes with only occasional sightings observed in the U.S. Atlantic EEZ during the late summer (CeTAP 1982; Wenzel *et al.* 1988). Records also exist of this species occurring off Florida and in the Gulf of Mexico though their distribution in southern waters remains largely unknown (Yochem and Leatherwood 1985 as cited Waring *et al.* 2001). It has generally been accepted that the North Atlantic consists of two stocks of blue whales (western and eastern) however, stock structure has not been examined through molecular or other appropriate analyses. The U.S. Navy has acoustically tracked blue whales in much of the North Atlantic including subtropical waters north of the West Indies and in deep water east of the U.S. EEZ (Clark 1995 as cited in Waring *et al.* 2001). Evidence from acoustic work has suggested that individual blue whales may range over the entire ocean basin leading some to speculate that they form a single population that breeds at random (NMFS 1998 and references therein). The few population estimates that currently exist for blue whales in the western North Atlantic tend to be specific to particular areas (see NMFS 1998). Mitchell (1974) estimated the entire western North Atlantic population to number in the low hundreds during the late 1960s and 1970s. It's thought that since their protection from commercial hunting, some populations of blue whales have shown signs of recovery while others have not been monitored to the extent of being able to determine their status.

Blue whales are the largest of the cetaceans reaching lengths of over 80 feet in the North Atlantic. Females give birth approximately every two to three years bearing a single calf. Assumed to be a long-lived species, they are thought to attain sexual maturity between 5 and 15 years of age (Mizroch *et al.* 1984; Yochem and Leatherwood 1985 as cited in NMFS 1998). Their diet consists primarily of krill.

Though commercial whaling has had a severe effect on the status of blue whales worldwide, the western North Atlantic population has not been subjected to legal hunting since the 1960s. Today, potential threats are more likely to occur from collisions with vessels, entanglement in fishing gear and habitat degradation in the forms of both noise and chemical pollution. Currently, there are no confirmed records of mortalities or serious injuries from fishery interactions occurring in the U.S. Atlantic EEZ. It is unclear as to whether blue whales are just less prone to becoming entangled or if their large size allows them to break through nets or carry gear away with them. If the latter is the case, there may be undiscovered mortalities resulting from gear-related injuries. The total level of human-caused mortality and serious injury is unknown but believed to be insignificant (Waring *et al.* 2001). The estimated PBR for the western North Atlantic blue whale is 0.6. NMFS has put into effect a Recovery Plan for blue whales that was published in 1998.

Fin whale, *Balaenoptera physalus*

Fin whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). Modern whaling depleted most stocks of fin whales. Commercial hunting in the North Atlantic ended in 1987 though Greenland still conducts an "aboriginal subsistence" hunt allowed under the International Whaling Commission.

The overall distribution pattern of fin whales is complex. They appear to display a less obvious north/south pattern of migration exhibited by other baleen whales. Based on acoustic studies, a general southward "flow pattern" from the Labrador/Newfoundland region south past Bermuda and into the West Indies occurs in the fall (Clark 1995 as cited in NMFS 1998a).

Fin whales are known to occur from the Gulf of Mexico northward to the arctic pack ice (NMFS 1998a and references therein). They are common in the waters of the U.S. Atlantic EEZ primarily from Cape Hatteras northward (Waring *et al.* 2001). For management purposes, NMFS recognizes only a single stock of fin whales in the U.S. waters of the western North Atlantic, though genetic data support the idea of several subpopulations (see Bérubé *et al.* 1998). A survey conducted in 1999 from Georges Bank northward to the Gulf of St. Lawrence, led to an estimate of 2,814 (CV=0.21) individuals for the western North Atlantic population. This however, is considered a conservative estimate due to the extensive range of the fin whale throughout the entire North Atlantic and the uncertainties regarding population structure and exchange between surveyed and un-surveyed areas. To date, there is insufficient information in order to determine population trends.

Fin whales are thought to attain sexual maturity at around 10 years of age or older though it appears that exploited populations can mature as early as age 6 or 7 (Gambell 1985 as cited in NMFS 1998a). The calving interval is estimated to be about 2 years but may be longer in unexploited populations (Agler *et al.* 1993 as cited in NMFS 1998a). Regional distribution of fin whales is most likely influenced by prey availability with krill and small schooling fish such as capelin, *Mallotus villosus*, herring, *Clupea harengus*, and sand lance, *Ammodytes* spp., believed to be their main prey items (NMFS 1998a and references therein).

Aside from the threat of illegal whaling or increased legal whaling, potential threats affecting fin whales include collisions with vessels, entanglement in fishing gear and habitat degradation from chemical and noise pollution. Fin whales are known to have been killed or seriously injured by inshore fishing gear (gillnets and lobster lines) off eastern Canada and the United States (NMFS 1998a). The total level of human-caused mortality or serious injury is unknown, but is considered to be less than 10% of the calculated PBR (4.7) and thus not significant (Waring *et al.* 2001). A draft recovery plan for fin whales is available but the plan has not yet been finalized.

Sei whale, *Balaenoptera borealis*

Sei whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). Sei whales began to be regularly hunted by modern whalers after the populations of larger, more easily taken species (i.e. humpbacks, right whales and gray whales, *Eschrichtius robustus*) had declined. Most stocks of sei whales were also reduced, in some cases drastically, by whaling efforts throughout the 1950's into the early 1970's. International protection for the sei whale began in the 1970's though populations in the North Atlantic continued to be harvested by Iceland until 1986 when the International Whaling Commission's moratorium on commercial hunting in the Northern Hemisphere came into effect.

The sei whale is one of the least well studied of the "great whales". Hence little is known about the distribution and current status for most stocks. They are believed to undertake seasonal north/south movements, with summers spent in higher latitudes feeding and winters in lower latitudes. In the western North Atlantic, it is thought that a large segment of the population is centered in northerly waters, perhaps the Scotian Shelf during the summer feeding season (Mitchell and Chapman 1977 as cited in Waring *et al.* 1999). Their southern range during the spring and summer includes the northern areas of the U.S. Atlantic EEZ (i.e. Gulf of Maine and Georges Bank). Strandings along the northern Gulf of Mexico and in the Greater Antilles, indicate those areas to be the southernmost range for this population (Mead 1977 as cited in Waring *et al.* 1999). The sei whale is generally found in deeper waters though they are known for periodic excursions into more shallow and inshore waters when food is abundant (Payne *et al.* 1990).

Sei whales are not known to be common anywhere in U. S. Atlantic waters (NMFS 1998a). Stock identification in the western North Atlantic remains unclear however, there is some evidence of two stocks consisting of a Nova Scotia stock and a Labrador Sea stock (Mitchell and Chapman 1977 as cited in Waring *et al.* 1999). The Nova Scotia stock is thought to extend along the U. S. coast to at least North Carolina. The total number of sei whales in the U. S. Atlantic EEZ is not known and there are no recent abundance estimates.

Sei whales attain sexual maturity at approximately 8-10 years of age and females are thought to calve every two years or so (Lockyer and Martin 1983 as cited in NMFS 1998a). Their primary food are calanoid copepods and euphausiids (NMFS 1998a and references therein).

Since the cessation of commercial whaling, threats to sei whales in the western North Atlantic appear to be few although do include ship collisions and entanglement in fishing gear. Because of their offshore distribution and overall scarcity in U. S. Atlantic waters, reports of entrapments and entanglements tend to be low. It is unknown whether sei whales are less prone to interact with fishing gear or if they break through or carry the gear away with them causing mortalities that go largely unrecorded. There were no reported fishery-related mortalities or serious injuries observed by NMFS during 1991-1997 however, the total level of human-caused impacts is unknown but thought to be insignificant (Waring *et al.* 1999). PBR for the western North Atlantic sei whale is unknown since there is no minimum estimate of population size however, any fishery-related mortality would be unlawful as there is no recovery plan currently in place.

Humpback whale, *Megaptera noveangliae*

Humpback whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). Because of their nature to aggregate on both summer and winter grounds, often near coasts, humpbacks were relatively easy prey for shore-based whalers. As a result, their populations were severely depleted by the time they achieved protection from commercial hunting in 1966.

Humpback whales utilize the northwestern Atlantic as a feeding ground during the summer with most then migrating to calving and breeding areas in the Caribbean during the winter (Clapham *et al.* 1993; Katona and Beard 1990). A significant number of animals however, are observed in mid- and high-latitude regions in the winter (Swingle *et al.* 1993). Based on sighting and stranding information, it appears that young humpbacks in particular have increased in occurrence along the coasts of Virginia and North Carolina during the winter (Wiley *et al.* 1995). There have also been

increased wintertime sightings off the coastal waters further southeast (Waring *et al.* 1999a and references therein). Photographic mark-recapture analyses from the Years of the North Atlantic Humpback (YONAH) project conducted in 1992/1993, gave an ocean-basin-wide estimate of 10,600 individuals (CV=0.067) which to date is regarded as the best available estimate for the North Atlantic. It appears that the humpback whale population is increasing though it is unclear whether this increase is ocean-wide or confined to specific feeding grounds.

Female humpbacks are thought to reach sexual maturity between 4 and 6 years of age whereas males tend to be older attaining sexual maturity between 7 and 15 years (as cited in NMFS 2001). Calving intervals observed for the western North Atlantic are approximately every 2 to 3 years (Clapham and Mayo 1990). Humpback whales are described as opportunistic feeders, foraging on a variety of food items including euphausiids and small schooling fish such as herring, sand lance and mackerel (Paquet *et al.* 1997, Payne *et al.* 1990). In the mid-latitudes during the winter, juvenile humpbacks are also known to eat bay anchovies and menhaden, *Brevoortia tyrannus*.

Although habitat degradation, such as chemical and noise pollution, may be adversely affecting the recovery of humpbacks, the major threats appear to be vessel collisions and entanglements with fishing gear (see Waring *et al.* 2001 for synopsis of mortality/injury). Wiley *et al.* (1995) examining stranding data obtained principally from the mid-Atlantic, found that in the 20 cases where evidence of human impact was discernable, 30% had major injuries possibly caused by a vessel collision and 25% had injuries consistent with entanglement in fishing gear. Presently, there is insufficient information on the North Atlantic population overall to reliably determine population trends. Even though the total level of human-caused mortality or serious injury is not actually known, the total fishery-related mortality and serious injury for this stock is not less than 10% of the calculated PBR (33) and is therefore considered to be significant (Waring *et al.* 1999a). A Recovery Plan is in effect (NMFS 1991).

Northern right whale, *Eubalaena glacialis*

Northern right whales are listed as endangered under the Endangered Species Act of 1973, as amended (ESA). They are also protected under the Marine Mammal Protection Act of 1972 (MMPA). Hunting is the major reason the western North Atlantic right whale population has declined to less than 300 individuals. Presently, the North Atlantic right whale is considered one of the most critically endangered populations of large whales in the world (Clapham *et al.* 1999 as cited in Waring *et al.* 2001). The species was continually hunted off the east coast of the United States for three centuries possibly reducing its numbers to less than 100 individuals by the time international protection from the League of Nations came into effect in 1935 (see Waring *et al.* 2001 and reference therein). Right whales have been protected from commercial whaling under legislation of the International Whaling Commission since 1949 (NMFS 1991a).

Western North Atlantic right whales occur in the waters off New England and northward to the Bay of Fundy and the Scotian Shelf during the summer (Waring *et al.* 2001). During the winter, a segment of the population, consisting mainly of pregnant females, migrates southward to calving grounds off the coastal waters of the southeastern United States. Right whales use mid-Atlantic waters as a migratory pathway between their summer feeding grounds and winter calving grounds. During the winters of 1999/2000 and 2000/2001, considerable numbers of right whales were recorded in the Charleston, South Carolina area (NMFS 2001). Currently, it remains unclear whether this is typical or reflects a northern expansion of the normal winter range.

Based on photo-identification techniques, the western North Atlantic population size was estimated to be 291 individuals in 1998 (Kraus *et al.* 2000 as cited in Waring *et al.* 2001). This estimate may be low if animals were not photographed and identified or if animals were incorrectly presumed dead due to not being seen for an extended period of time. The population growth rate estimated for the western North Atlantic population during the late 1980's through early 1990's suggested that the stock was slowly recovering (Knowlton *et al.* 1994). However, a review of work conducted in 1999 indicated that the survival rate of the northern right whale had declined during the 1990's (as cited in Waring *et al.* 2001). One factor currently under review for this decline is the apparent increase in the calving interval. The mean calving interval pre-1992 was estimated at 3.67 years. An updated analysis considering data through the 1997/98 season indicated that the mean calving interval had increased to more than 5 years (Kraus *et al.* 2000 as cited in Waring *et al.* 2001). Reasons under consideration for this shift include contaminants, biotoxins, nutrition/food limitation, disease and inbreeding problems.

The primary sources of human-caused mortality and injury of right whales include ship strikes and entanglement in fishing gear. A recent study estimated that 61.6% of right whales show injuries consistent with entanglement in gear while 6.4% exhibited signs of injury from vessel strikes (Hamilton *et al.* 1998). With the small population size and low annual reproductive rate, human-caused mortalities have a greater impact on this species relative to other species. As such, due to the overall decline in the western North Atlantic right whale population, the PBR is set at zero (Waring *et al.* 2001).

Three right whale critical habitats were designated by NMFS (59 FR 28793; June 3, 1994). Two are off New England, Cape Cod/Massachusetts Bay and Great South Channel. The third is off the southeastern coast of the United States [between 31°15' N. latitude (approximately the mouth of the Altamaha River, Georgia) and 30°15' N. latitude (approximately Jacksonville Beach, Florida) extending from the coast out to 15 nautical miles offshore and the coastal waters between 30°15' N. latitude and 28°00' N. (approximately Sebastain Inlet, Florida) from the coast out to 5 miles]. Programs to foster both awareness and mitigate potential problems of anthropogenic injury and mortality to right whales have been implemented in both the northeast and southeast areas. One such program is the Mandatory Ship Reporting System requiring vessels over 300 tons to report information on their location, speed and direction once in a critical habitat. In return they receive information on right whale occurrence and recommendations on measures to avoid collisions with whales. A Recovery Plan was published in 1991 by NMFS and is in effect. A revised plan is due out presently.

Kemp's ridley turtle, *Lepidochelys kempii*

Kemp's ridley turtles are listed as Endangered under the Endangered Species Act of 1973, as amended. Their population has declined since 1947 with the primary cause being attributed to human activities such as egg collection, fishing for juveniles and adults and hunting adults for meat consumption and other products. In addition, Kemp's ridleys have been adversely impacted by high levels of incidental capture by shrimp trawlers (NMFS 2001a). Of all the species of marine turtles, this species has declined to the lowest population level.

Kemp's ridleys occur mainly in coastal areas of the Gulf of Mexico and along the east coast of the U.S. with sightings extending as far north as Cape Cod Bay, Massachusetts (NMFS 2001b). Post-hatchlings appear to inhabit pelagic waters of the Gulf and north Atlantic Ocean where they feed on *Sargassum* and associated fauna. Ridleys then move into shallow, nearshore waters after one or two

years and forage primarily on crabs. The principal nesting beaches are found in Mexico though a few nest each year in south Texas. The nearshore waters of the Gulf and Atlantic provide important habitat for juveniles. It is believed that the Gulf coast from Port Aransas, Texas through Cedar Key, Florida is primary habitat for subadult ridleys in the northern Gulf of Mexico (Ogren 1988 as cited in NMFS 2001). Preliminary analysis of tagging studies conducted by Texas A&M University, suggests that subadult ridleys remain in warm, shallow, nearshore waters in the northern Gulf until cooler waters push them offshore or south along the Florida coast (NMFS 2001). Sexual maturity is thought to occur between 7-15 years indicating that this species is probably long lived.

In 1995, NMFS established the Turtle Expert Working Group (TEWG) consisting of population biologists, sea turtles scientists and managers. Charged with conducting an assessment of the Kemp's ridley population, the group suggested that the population was in the early stages of recovery, though strandings in some years have increased at rates higher than the estimated rate of population increase (TEWG 1998 as cited in NMFS 2001). Of particular concern was the relatively high numbers of Kemp's ridley carcasses occurring on Texas and Louisiana beaches in recent years. These strandings tended to occur during periods of high levels of shrimping and are believed to have been incidentally taken by the shrimp fishery though other sources of mortality for this species exists in these waters. Overall, the TEWG indicates that the population appears to be increasing through the efforts of nest protection programs implemented by both the U.S.FWS and Mexico's Instituto Nacional de Pesca and the use of Turtle Excluder Devices (TEDs) by the shrimp fishery.

Even though the recovery of this population appears to have begun, caution is still necessary due to a variety of factors. Major threats still exist in the form of incidental capture in both commercial and recreational fisheries. Fishing gear known to have captured turtles includes bottom trawls, gillnets, longline, pound nets, traps used to harvest crabs, whelk, lobster and reef fish, dredge and hook and line (NMFS 2001b). Ingestion of marine debris, dredging and coastal construction, beach development and artificial lighting on nesting beaches are also known to negatively impact turtles. In the Gulf of Mexico, oil spills are also a concern. To further the recovery of the Kemp's ridley turtle population, NMFS joined the cooperative conservation effort at Rancho Nuevo in 1996 whose objective is to protect area nesting females, ensure high hatchling production and facilitate research efforts. Moreover, NMFS has implemented regulations to help reduce incidental capture in the shrimp and summer flounder trawl fishery, longline fisheries, pound net fishery in Chesapeake Bay, Virginia and gillnet fisheries in Pamlico Sound, North Carolina. A Recovery Plan is in effect for the Kemp's ridley turtle (USFWS and NMFS 1992)

Hawksbill turtle, *Eretmochelys imbricata*

Hawksbill turtles are listed as Endangered under the Endangered Species Act of 1973, as amended. Most populations appear to be declining (as much as 80% during the last 100 years) or depleted (Meylan 2001).

Hawksbill turtles occur in tropical and subtropical seas in the Atlantic, Pacific and Indian Oceans. They are widely distributed throughout the Caribbean Sea and western North Atlantic with sightings occasionally occurring as far north as Massachusetts. Hawksbills utilize different habitats during various stages of their life cycle (NMFS 2001c). Post-hatchlings inhabit the pelagic environment, using weedlines that accumulate at convergence points as shelter. After several years at sea, hawksbills head toward coastal waters. Coral reefs are considered the resident foraging habitat for juveniles, sub-adults and adults as they feed primarily on sponges. Ledges and caves are used for resting. Nesting tends to occur on small pocket beaches. A single female may nest 3 to 5 times each

season with clutch sizes of up to 250 eggs (Meylan 2001). Females exhibit a high degree of fidelity to their nest sites and genetic studies suggest that nesting populations be treated as separate stocks whereas feeding grounds typically include turtles from multiple nesting populations (Meylan 2001). Age at which hawksbills attain sexual maturity is unknown however, they are slow growing indicating it occurs at a later age.

The following distributional information is from Meylan (2001). The Atlantic coast of Florida is the only area in the U.S. where hawksbill turtles nest on a regular basis however, four nests have been the maximum counted in any year from 1979-2000. Strandings occur along the entire Atlantic coast although the majority are found south of Cape Canaveral. Most strandings involve pelagic-staged turtles that are perhaps dispersing from nesting beaches in the Gulf and Caribbean. Juvenile and adults are also observed along Florida's Atlantic coast but not in large numbers.

Most hawksbill turtles in U. S. waters occur in Puerto Rico and the U.S.V.I. Mona Island. Puerto Rico has the largest known nesting aggregation in the Caribbean Basin with over 500 nests recorded annually during 1997-2000. As such, Mona Island has been designated as a critical habitat for hawksbill turtles and is protected under the administration of the Puerto Rico Department of Natural Resources and Environment. Nesting also occurs in other areas in Puerto Rico though many sites have not been systematically surveyed over a significant period of time. In the U.S.V.I., important nesting sites occur as well. A small, but seemingly static, nesting population has been surveyed since 1987 at Buck Island Reef National Monument off St. Croix. Nesting is also observed elsewhere on St. Croix and the Islands of St. John and St. Thomas. Juvenile and adult hawksbills are commonly found in the waters of the U.S.V.I. Tagging studies have indicated that immature turtles remain resident in these waters for extended periods.

Primary threats to the hawksbill turtle populations along the Atlantic coast include fouling from petroleum products, ingestion of marine debris, loss or degradation of habitat (i. e. beach development and artificial lighting on nesting beaches), boat strikes and capture on hooks or entanglement in fishing gear or other marine debris. In the Gulf, marine pollution (particularly oil) as well as entanglement, habitat loss and boat-related injuries are also issues. The Caribbean populations face similar threats along with incidences of poaching and illegal trade for tortoiseshell and stuffed juvenile hawksbills (NMFS 2001b).

Regulations are in effect to help reduce incidental capture in the shrimp and summer flounder trawl fisheries, longline fisheries, pound net fishery in Chesapeake Bay, Virginia and gillnet fisheries in Pamlico Sound, North Carolina. A recovery plan is in effect (NMFS and USFWS 1993).

Green turtle, *Chelonia mydas*

Green turtles are listed under the Endangered Species Act of 1973, as amended, as threatened throughout its range except for the Florida and Pacific Mexico breeding populations, which are listed as endangered. The greatest cause of this species' decline is attributed to commercial harvest for food as well as products such as jewelry. Incidental catches in commercial shrimp trawlers are also considered to have had an adverse effect of its recovery.

Green turtles are observed in waters extending from Texas to Massachusetts as well as around the U.S.V.I. and Puerto Rico (NMFS 2001b). Important feeding grounds have been identified off both the southwest and southeast coastlines of Florida as well as the Florida Keys. The eastern coast of Florida is also thought to contain primary nesting sites (Ehrhart 1979 as cited in NMFS 2001).

Additional nesting sites are found in the U.S.V.I., Puerto Rico, South and North Carolinas. Hatchlings inhabit the pelagic environment where they are believed to associate with communities of *Sargassum*. After several years, the turtles head to coastal habitats where they forage on sea grasses and macroalgae in shallow bays, lagoons and reefs (Rebel 1974 as cited in NMFS 2001).

Green turtles are slow growing and delay sexual maturity until approximately 25-60 years of age (NMFS 2001b). Their total population size is unknown and determining population trends is difficult due to wide year-to-year fluctuations in numbers of nesting females. Current estimates of females nesting annually on Florida are approximately 700 on average (NMFS2001b).

Major threats affecting this species are similar to threats faced by other marine turtle species and include incidental capture in both commercial and recreational fisheries, ingestion of marine debris, artificial lighting on nesting beaches and coastal development or habitat loss. As with other species, NMFS has implemented regulations to help reduce incidental capture in the shrimp and summer flounder trawl fisheries, longline fisheries, pound net fishery in Chesapeake Bay, Virginia and gillnet fisheries in Pamlico Sound, North Carolina. In the Caribbean, the coastal waters of Culebra Island, Puerto Rico were designated as critical habitat in 1998. NMFS and USFWS have published a Recovery Plan for the Green turtle, which is in effect (NMFS and USFWS 1991).

Loggerhead turtle, *Caretta caretta*

Loggerhead turtles were listed as threatened under the Endangered Species Act of 1973, as amended in July of 1978.

Loggerheads are found in bays, estuaries, lagoons and along continental shelves in temperate, subtropical and tropical waters of the Atlantic, Pacific and Indian Oceans. In the Atlantic, their range includes waters from Newfoundland southward to Argentina. They are considered the most abundant species of sea turtle occurring off U.S. shores.

Loggerhead turtles attain sexual maturity between the ages of 20 and 38 (NMFS 2001b). Females reproduce approximately every 2.5 years and eggs are laid throughout the summer (Richardson and Richardson 1982 as cited in NMFS, SEFSC 2001). The largest known nesting concentrations in the U.S. are along the east coast of Florida. Additional nesting sites occur in Georgia, the Carolinas and the Gulf Coast of Florida. Five nesting subpopulations have been identified in the western North Atlantic through genetic analyses (NMFS 2001b). A northern subpopulation occurs from North Carolina to northeast Florida. South Florida has a second nesting subpopulation, the Florida Panhandle a third and a fourth occurs on the eastern Yucatán Peninsula. The fifth nesting subpopulation occurs on the islands of the Dry Tortugas near Key West Florida. Nesting trends are available for the northern and south Florida subpopulations. Nesting females in Georgia and the Carolinas appear to be stable at best if not declining while numbers for south Florida are thought to be increasing though the most recent evidence indicates that their rate of increase may be slowing (NMFS, SEFSC 2001). These trends are of adult nesting females and may not reflect growth rates for the overall population.

Each nesting assemblage is considered a distinct reproductive population. The sex of loggerhead hatchlings is environmentally determined by the temperature of the nest during incubation (NMFS, SEFSC 2001). In general, warmer temperatures as found in nesting sites near Cape Canaveral, Florida produce more females whereas the cooler temperatures affecting nesting sites in the northern subpopulation produce predominantly males. Since males appear not to exhibit the same degree of

site fidelity as nesting females, it is thought that the high proportion of males produced in the northern subpopulation are an important source of males throughout the southeast U.S., making that small subpopulation very important with regard to management decisions.

In the Atlantic, hatchlings head directly offshore and are found associating with *Sargassum* in pelagic driftlines (NMFS 2001b). Loggerheads spend 7 to 13 years in the pelagic environment until reaching a size of approximately 16-20 inches when they move to near-shore and estuarine waters. Once inshore, they inhabit benthic habitats where they feed primarily on invertebrates. Their foraging grounds contain individuals from various nesting colonies from throughout the western North Atlantic (TEWG 2000 as cited in NMFS, SEFSC 2001).

One primary threat to the loggerhead population is incidental capture in fishing gear. Gear known to impact this species includes trawl, gill nets, longline, hook and line, pound nets, long haul seine, channel nets and lobster pots. Conservation efforts on both the state and federal levels have been helpful in mitigating fishery and sea turtle interactions. The requirement to use TEDs by commercial shrimpers in the U.S. Atlantic and Gulf of Mexico, has greatly reduced the mortality of this species in that fishery. Concerns remain however, as evidence suggests that large subadults and adults may not be able to escape through the TEDs currently authorized for use. NMFS has recently proposed modifying the size of the escape opening on TEDs used by shrimp trawlers to allow for larger, benthic immature and adult loggerheads to escape. On the state level, Georgia now requires the use of TEDs in their whelk trawl fishery in state waters and almost all gill netting in the state waters of South Carolina, Georgia, Florida, Louisiana and Texas is prohibited. Entanglement nets are also prohibited in most fisheries managed by the South Atlantic Fishery Management Council. Other management actions have been implemented by NMFS to help reduce incidental takes in pelagic longline fisheries, pound net fishery in Chesapeake Bay, Virginia and gillnet fisheries in Pamlico Sound, North Carolina. Other factors adversely impacting this species include habitat degradation, particularly of nesting habitats as well as ingestion of marine debris and biotoxins. In 1991, NMFS and USFWS have published a Recovery Plan for the loggerhead and it is in effect.

Leatherback turtle, *Dermochelys coriacea*

Leatherback turtles were listed as endangered throughout its range in June of 1970 under the Endangered Species Act of 1973, as amended.

Leatherbacks are largely pelagic and inhabit the open ocean as hatchlings and remain through adulthood. They do, however, move into coastal waters to feed and reproduce. In the Atlantic Ocean, leatherbacks have been observed as far north as Labrador, Canada and as far south as Argentina and South Africa (NMFS, SEFSC 2001 and references therein). Pelagic coelentrates are their major prey items and the movements of leatherbacks appear to be closely associated with their search for food.

Aerial surveys conducted along the western North Atlantic have provided information regarding the seasonal movements of leatherbacks. Large juveniles and adults from the southeastern coast appear to move to the mid-Atlantic in the spring with some individuals continuing further north up to Canadian waters in the summer. During the fall and winter, leatherbacks travel southward or perhaps farther offshore. Movements of smaller juvenile leatherbacks remain unclear, as aerial surveys are limited to observations of larger individuals.

Little is known about the population structure of leatherbacks. The sex ratio for leatherbacks appears to vary with location, season and year (Leslie *et al.* 1996 as cited in NMFS, SEFSC 2001). Males

tend to be produced more during wetter, cooler months while females tend to predominate during drier, warmer months. Estimates of the population are done through surveys of nesting females. Despite being a long-lived species, generally living over 30 years, female leatherbacks, in some cases, are thought to attain sexual maturity as early as 3-6 years to 13-14 years (Rhodin 1985; Zug and Porham 1996 as cited in NMFS 2001). They nest approximately every 2-3 years producing 100 or more eggs per clutch. Three primary nesting beaches are known to occur in the U.S. St. Croix, U.S.V.I., Culebra Island, Puerto Rico and along the southeast Florida coast (NMFS 2001b). Nesting females have increased from 20 per year to over 100 in St. Croix (NMFS 2001b). Increases have also been recorded in Florida and Puerto Rico, however, overall nesting populations worldwide have declined (NMFS, SEFSC 2001).

In 1978, the USFWS established a critical habitat for this species in the U.S.V.I. at Sandy Point, St. Croix. A year later, NMFS extended this designation to include the waters around Sandy Point (Bell and Spotila 2001 as cited in NMFS, SEFSC 2001).

As with loggerhead turtles, a variety of fisheries use gear that impacts leatherbacks. Gillnets, longlines, trawls and pot gear are of the most concern. Currently, TEDs authorized for use in the U.S. shrimp industry are generally not capable of excluding adult leatherbacks. Hence, NMFS has recently proposed modifying the size of the escape opening on TEDs used by shrimp trawlers to allow for leatherbacks to escape. In 1995, NMFS in cooperation with several southeastern states implemented the Leatherback Contingency Plan. This plan was developed to help reduce leatherback mortality in shrimp trawls by enabling NMFS to establish leatherback conservation zone regulations which stipulate using weekly aerial surveys to assess turtle concentrations along the coast from Cape Canaveral, Florida to the North Carolina/Virginia border. If concentrations were high (10 turtles/50 nm), then the area was closed to shrimp trawlers not using TEDs modified with the leatherback escape opening. NMFS can also impose emergency measures to further protect the turtles when warranted. In addition, many of the state fishery conservation efforts in place to reduce incidental capture of other sea turtles also have beneficial effects for the leatherback. Other factors impacting this species include illegal harvesting of nesting females and/or their eggs, destruction of nesting habitat and ingesting marine debris. In 1992, NMFS and USFWS published a Recovery Plan for leatherback turtles, which is in effect.

Seabirds

To address on-going concerns regarding seabird and fisheries interactions, the National Marine Fishery Service recently initiated an Interagency Seabird Working Group (ISWG). The group is comprised of representatives from NMFS, USFWS., regional Councils and Department of State. The first meeting of the ISWG was held via video/teleconference January 15, 2002. The new initiative is looking to find practicable and effective solutions to seabird/fishery interactions. The immediate focus is to address issues through the implementation of the *National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries*, however, it is recognized that potential interactions of seabirds and fisheries other than longlines also need to be addressed.

To date, no specific seabird/gear interaction assessments have been conducted for the fisheries managed by the South Atlantic, New England and Mid-Atlantic Councils though incidental takes of seabirds have been recorded by both the Southeast Fisheries Science Center (SEFSC) Pelagic Longline and New England and Mid-Atlantic Gillnet Fisheries Observer Programs.

Due to relatively high incidental takes of seabirds, including the endangered short-tailed Albatross, off the Alaskan coast, the North Pacific Fishery Management Council has taken the lead by

instituting seabird regulations for vessels using hook and line gear in groundfish and halibut fisheries off Alaska. At its December 2001 meeting in Anchorage, Alaska, the North Pacific Fishery Management Council recommended changes to the existing regulations for seabird avoidance measures endorsing seabird avoidance measures on all vessels greater than 26 ft LOA using hook and line gear: large vessels (> 55 ft LOA) and also on smaller vessels that were not specifically addressed in the experimental regime of the Washington Sea Grant Program (WSGP) research. The proposed changes were based on results from a cooperative research effort that included fishery scientists from the WSGP, the University of Washington, NOAA Fisheries, US FWS, and the North Pacific Fishery Management Council.

Effects of Actions on Listed Species and Designated Critical Habitats in Action Area

Effects on Large Whales

The FMP specifies allowable gear for dolphin and wahoo in the Atlantic EEZ as longline and hook and line which includes manual, electric or hydraulic rod and reels, bandit gear, handline and spearfishing gear. Pelagic longlines are classified as a Category I fishery under the Marine Mammal Protection Act (MMPA) indicating that the gear is associated with frequent serious injury or mortality of marine mammals. While large whales could become entangled in longlines, federal observers in the Atlantic fishery have not recorded such incidents. As reviewed within the Biological Opinion for the HMS FMP prepared by NMFS (2001), the Atlantic pelagic longline fishery may affect but is not likely to jeopardize the continued existence of the sperm, blue, fin, sei, humpback or northern right whale. Under the HMS final rule (FR 00-19272), effective August 1, 2000, specific actions prohibit pelagic longline fishing in certain areas including the Charleston Bump and the southeastern coast of Florida. The South Atlantic Fishery Management Council understands that if longline vessels redirect their effort to dolphin and wahoo in the HMS closed areas, it may compromise the biological basis and enforceability of the regulations established to reduce bycatch of juvenile highly migratory species. As such, Action 20 of the Dolphin Wahoo FMP prohibits the use of surface and pelagic longline gear for dolphin/wahoo within any “time or area closure” in the South Atlantic Fishery Management Council’s area of jurisdiction that is closed to pelagic gear under the HMS FMP (Florida’s east coast and Charleston Bump). These area closures encompass right whale critical habitat as well as surrounding waters where right whales have been sighted during their calving season. This action, therefore, further decreases potential risk of interaction with longline gear to calving/nursing right whales or overwintering humpbacks.

The handline/rod and reel gear fisheries are listed as Category III fisheries under the MMPA due to their low risk of interacting with marine mammals. NMFS has received a few reports of whale entanglements in handline gear, but on further examination of these events, the whales appeared not to have been injured or were able to disentangle themselves. Available information regarding marine mammal interactions with hook and line gear is often anecdotal. Specimens commonly are of stranded animals and consist of individuals with only fragments of gear or line marks on the body thus making it difficult to attribute the gear to a particular fishery. Mortalities of bottlenose dolphins due to ingestion of hooks and/or line have been documented (see Gorzelany 1998; Well *et al* 1998), though, again, particular fisheries could not be determined and the gear most likely had been discarded or was consumed via a fish that had been hooked and broke away with the gear.

Effects on Sea Turtles

To evaluate the effects of the proposed actions on sea turtles, each fishery and specific fishing techniques will be addressed individually.

Longline Fishery

As mentioned earlier, the longline component of the fishery consists of longliners that primarily target highly migratory species but may also catch dolphin and longliners that target dolphin directly. Longline fisheries generally affect sea turtles by entangling or hooking them. Turtles that become entangled risk drowning when they are forcibly submerged or they may incur injuries from the entangling lines. Turtles that are hooked can be injured or killed depending on whether they are hooked externally - generally in the flippers, head or beak - or internally, where the animal has ingested the hook. Because of a turtle's digestive structure, deeply ingested hooks are difficult to remove from a turtle's mouth without seriously injuring it (NMFS 2001). In addition to the immediate effects, entanglement in longline gear can have long-term effects on a turtle's ability to swim, forage, migrate and breed, though these effects are much more difficult to monitor or measure (NMFS 2001).

Sea turtles appear to be attracted to the floats used on longline gear. They may be responding to gelatinous organisms or algae that collect on buoys and buoy lines at or near the surface. An analysis of observer data from the Hawaii based pelagic longline fishery indicated that the proximity of the gangion to a floatline had a strong, significant effect on turtle catch rates (Kleiber 2000, unpublished). For hauls that captured loggerheads, 45% were caught on the hooks nearest a floatline even though those hooks represented only 20% of the total hooks set. The remaining 80% of the gangions set farther from the floatlines accounted for 55% of the loggerhead incidental captures. Results were similar for leatherbacks. It is also possible that this reflects a depth effect, as hooks closest to floatlines are shallower than hooks set farther away and thus first to be encountered.

HMS Longline Fishery

The pelagic longline fishery targeting highly migratory species has been addressed in the Biological Opinion prepared by NMFS (2001) for the HMS FMP. Thus this fishery will not be considered further in this analysis except to summarize the conclusions stated in the Biological Opinion. It was concluded that 1) the Atlantic pelagic longline fishery may adversely affect but is not likely to jeopardize the continued existence of Kemp's ridley, green or hawksbill sea turtles, and 2) continued operation of the Atlantic pelagic longline fishery is likely to jeopardize the continued existence of the leatherback and loggerhead sea turtles. Pelagic longline gear most commonly catches loggerhead and leatherback turtles. Loggerheads are most vulnerable to pelagic longlines during their pelagic, immature stage, which may last from 7 to 13 years whereas leatherbacks are exposed to the pelagic fishery throughout their life cycle (NMFS 2001).

Directed Longline Fishery

The directed longline fishery, though a small component of the dolphin/wahoo fishery, is of concern due to the practice of setting hooks near the surface, which may increase the likelihood of capturing leatherback and loggerhead turtles. Sea turtle mortality associated with the pelagic longline fishery along with the estimated amount of reductions necessary to allow for long-term population increases have been accounted for in population models presented in the HMS FMP (see NMFS 2001). However, mortalities associated with the directed longline fishery have not been incorporated into these models. Any additional mortalities associated with directed longline sets for dolphin need to be

fully assessed to ensure this fishery does not pose a significant threat to the northern nesting subpopulation of loggerheads and to leatherbacks. Although the practice of this fishery to haul back immediately increases the chance of caught turtles being released alive, post-release survival estimates are not sufficiently known.

With current restrictions in place regarding time/area closures and the proposed action to establish a 3,000 pound trip limit for dolphin north of 31° N. latitude and a 1,000 pound trip limit for dolphin south of 31° N. in the EEZ southward through the South Atlantic Fishery Management Council's area of jurisdiction, it is unlikely that this fishery will expand. The directed longline fishery has, at times, harvested upwards of 25,000 pounds or more per trip. It is thought that a 3,000 or 1,000 pound trip limit may either drastically reduce or, perhaps, even eliminate this directed effort. An effort reduction along with gear modifications required by NMFS will most likely further reduce the directed longline fishery's impacts on sea turtles.

With regard to management decisions when considering allowable gear types, a study conducted in the Azores longline fishery examined the effects of different styles of hooks on sea turtle captures. Overall, it was shown that gear type and placement could effect the number of incidental captures. One example was the comparison of Standard “J” hooks, Offset “J” hooks and circle hooks with the percentage of turtles hooked in the throat. Circle hooks, which is already fairly standard gear with longliners fishing for dolphin, were correlated with the least amount of turtles hooked in the throat (see NMFS, SEFSC 2001). This study also showed a tendency for more turtles to be caught on hooks closest to buoys; however, there was no significant effect of hook position along the mainline on turtle bycatch.

Hook and Line Fishery

Hook and line gear constitutes the majority of the dolphin and wahoo fishery. Information from observer comments, reports from the public and stranding data from the Atlantic, shows that all species of sea turtles have been impacted by hook and line fisheries (STSSN unpublished data and NMFS public sighting database, Beaufort, North Carolina). Since these data sources are descriptive in nature, consistent information regarding the type of hook and line fishery or targeted species is lacking. Although they do indicate that incidental capture is not uncommon with hook and line gear. As with longlines, sea turtles can interact with hook and line gear by becoming entangled and/or hooked. Turtles that ingest hooks often face the additional risk of needing to be moved to a facility that can surgically remove the hook. There have been recorded instances of turtles not surviving surgery (STSSN unpublished data). With turtles that are too large to be lifted on board a vessel, removal of gear may be difficult if not impossible. Gear left on, such as trailing line from an ingested hook, may pose serious risks to turtle. Researchers from the Mediterranean have described an “accordion effect” which can occur if a turtle swallows monofilament that is still attached to an embedded hook. The intestines, as it attempts to pass the unmoving monofilament line, coils and wraps upon itself usually killing the turtle (as reported in NMFS 2001). Trailing line may also snag on floating or fixed objects further entangling the turtle. Fishermen and observers are generally instructed to clip the line as close to the hook as possible when removal of the hook is not feasible. It appears that many turtles caught in hook and line fisheries are released alive though the condition and status of these turtles after their release remains unknown.

Trolling

Much of the hook and line fishery for dolphin and wahoo throughout the action area is executed by trolling near or through weedlines. The lines are pulled behind both recreational and commercial vessels at speeds varying between 4 to 10 knots. To date, there has not been a report of an incidental capture of a turtle while trolling. Though a potential may exist, the risk is considered to be low due to the speed at which the bait is pulled through the water making it difficult for a turtle to catch.

Casting

The technique of casting into a school of dolphin amid chunks of bait in the water as well as drifting over a school and casting lines directly on to the fish, may present more of a risk for sea turtle captures as the turtle would be more capable of biting the bait. However, since this type of fishing occurs near the surface, a turtle may be more visible and thus avoided. Unfortunately, as mentioned earlier, data sources on hook and line gear and turtle interactions are descriptive in nature making it difficult to quantify the rate of interactions with this or other particular types of hook and line fishing techniques.

Effects on Habitat

Pelagic longlines are thought to have negligible impact on habitat due to the lack of interaction with the benthic environment. The effects of hook and line are currently unknown due to lack of information (Barnette 2001). A minimal impact from these fisheries may occur during the pelagic-stage of sea turtles when they are known to associate with weedlines or rafts of macroalgae such as *Sargassum*. Dolphin are also known to forage on fauna associated with these rafts and weedlines often prompting fishermen to troll through them. In general, the bait used on trolling hooks is thought to be too large for the small turtles to pursue; however, the temporary disturbance of the floating habitat caused by fishermen deploying or retrieving gear, may break or remove cover used by the turtles; thus leaving them vulnerable to predation.

Located within the action area are three right whale critical habitats, which were designated by NMFS on June 3, 1994 (59 FR 28793). Two areas were designated in the northeast off Massachusetts and include portions of Cape Cod and Massachusetts Bays and the Great South Channel. The third area is off the coasts of southern Georgia and northern Florida. Actions that may adversely affect the value of designated critical habitat for the northern right whale are evaluated regardless of whether right whales are present within the critical habitat when adverse effects might occur. Concerns of how proposed actions may diminish the value of the critical habitats include 1) the distribution and relative abundance of gear associated with the fisheries as they pertain to the potential of increasing the risk of entanglements and mortalities, and 2) whether the fishery may diminish the value of the habitat by reducing the availability of right whale prey within the habitat. Since right whales feed primarily on copepods, the latter of the two concerns is highly unlikely. With regard to the former concern, as mentioned earlier, though large whales could become entangled in longlines it is unlikely. In addition, the Biological Opinion prepared for the HMS FMP indicates that the participants in the HMS fisheries, including longliners, generally do not co-occur in time and space with right whales while in these critical habitat areas. This along with the longline closures off the southeastern U. S. further lessen the potential for entanglement risk of longline gear to right whales.

Beneficial Effects

Several actions proposed by the Dolphin Wahoo FMP may prove beneficial in assessing fisheries and their interactions with protected species. Due to the scant information describing the effort and fishing practices of the hook and line fishery and components of the longline fishery, Actions 1-5, which create management units as well as require dealer and/or vessel permits, will allow for the collection of much needed data on the fisheries. In addition, Action 6, which requires fishery information from the Atlantic EEZ be reported to the Atlantic Coastal Cooperative Statistics Program (ACCSP), Recreational Fisheries Information Network and the Commercial Fisheries Information Network, will allow for better analyses and dissemination of data. The ACCSP Coordination Council has recently approved a module that deals with discard bycatch and protected species interactions. This module will be built into the ACCSP statistical system, which will improve reporting. Both quantitative and qualitative data will be collected for commercial and for-hire fisheries. Quantitative data will be collected through a coastwide, at-sea observer program as well as through a voluntary fishermen-reporting system. Recreational fisheries data will be collected through add-ons to existing recreational telephone surveys. Qualitative data will be collected through a number of different sources including sea turtle and marine mammal stranding networks, port agent interviewing and call-in reports.

Cumulative Effects

The event of incidental capture of the listed cetaceans found in the action area is considered rare for longline or hook and line fisheries. Although, other impacts such as disease, vessel strikes, entanglement in other fisheries and habitat degradation due to chemical and noise pollution as well as marine debris may cause adverse impacts on their populations' recovery. This is particularly true for the critically endangered northern right whale (see NMFS 2001 for details on cumulative impacts).

To fully assess the recovery of sea turtles, the full range of human and natural phenomena also need to be considered. Hurricanes may have potentially negative effects on the survival of eggs or on nesting habitat itself if the beach is greatly reduced. Human-related activities pose multiple threats. Entanglement in fishing gear other than longlines and hook and line (see NMFS 2001; NMFS, SEFSC 2001 for details). Loss of nesting habitat due to coastal development and impacts on orientation of nesting females as well as just hatched young due to artificial lighting on nesting beaches. Degradation of the marine habitat by chemical pollution and marine debris with the latter being a particular problem for sea turtles, as many types of plastics are perceived as food items. Direct taking of eggs or individual turtles whether legal or illegal. The impacts of many of these activities are under-monitored, particularly on the international level. NMFS has estimated that thousands of sea turtles of all species are incidentally or intentionally caught or killed annually by international activities (NMFS 2001).

Some anthropogenic mortality that contributed to the decline of sea turtles has been mitigated since sea turtles were listed under the ESA. Examples of such include the use of TEDs in shrimp trawlers, reduction or closure of certain fisheries using entangling nets and the prohibition of harvesting eggs and nesting females in the U.S. as well as other areas (for further information of sea turtle impacts see NMFS 2001; NMFS, SEFSC 2001).

Determinations

After reviewing the current status of the listed species known to occur in the action area of the Dolphin Wahoo FMP, and the effects of the continued operation of the fisheries involved as well as the probable cumulative effects, the following conclusions have been formed:

- 1) certain proposed actions may affect - is not likely to adversely affect - the collection of needed data on the operation and effort of the directed longline and the hook and line fisheries for use in future assessments;
- 2) continued operation of the directed longline and the hook and line fisheries in the action area may affect - is not likely to adversely affect - the continued existence of Johnson's Seagrass, Shortnose sturgeon, Atlantic salmon, Smalltooth sawfish, American Crocodile and the West Indian Manatee;
- 3) continued operation of the directed longline and the hook and line fisheries in the action area may affect - is not likely to adversely affect - the continued existence of sperm, blue, fin, sei, humpback, and northern right whales, or Kemp's ridley, Green, Hawksbill turtles;
- 4) continued operations of the directed longline and the hook and line fisheries in the action area may affect - is likely to adversely affect - the continued existence of the leatherback and loggerhead sea turtles; and
- 5) continued operations of the directed longline and the hook and line fisheries in the action area are not likely to destroy or adversely modify critical habitat designated for the northern right whale.

Recommendations

- 1) Based on current data evaluations indicating that specific modifications to fishing methods may reduce the threat of incidental capture to turtles (i. e. modifying the practice of deploying hooks nearer the surface or near floatlines to decrease sea turtle captures in longline gear), provisions should be provided for in future FMPs and any framework to provide flexibility for such modifications.
- 2) Create provisions to collect information that describes fishing practices, fishing effort as well as bycatch and incidental capture data to better assess potential impacts with protected species.
- 3) Collect the necessary data to assess the magnitude of recreational fisheries on sea turtles including post-release survival estimates. Sea turtle capture rates by hook and line type gear are qualitative and do not provide a basis for meaningful management recommendations thus reporting requirements for sea turtle interactions should be mandated through existing programs such as ACCSP. On-board observers should be placed on a proportion of trips to confirm reporting rates.
- 4) Provide public outreach for both commercial and recreational fishermen with regard to protected species and fisheries. Specifically, provide information pertaining to procedures to follow if they have an interaction with a protected species as well as guidelines to release and, if necessary, resuscitate sea turtles.

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Appendix G. Fishing Communities in the South Atlantic Region. (Source: SAFMC Dolphin Wahoo 1999 SAFE).

“4.3.3 Fishing Communities - Identify and define fishing communities

Identifying fishing communities provides a basis for analyzing impacts of management measures on fishing communities rather than on a fishery-wide basis. This would be more relevant in situations where impacts are differential because of the location, level of activity and dependency on fishing, availability of alternative job opportunities, etc. in different fishing communities. This measure would allow fishery managers to obtain information on the impacts of future management measures on different fishing communities. It could make for the formulation of management measures that would minimize impacts on fishing communities that have fewer opportunities to adapt to changes imposed by the measures.

Identification and definition of fishing communities would normally have a positive impact, except that, for the South Atlantic, there are no data collected on fishing communities. National Standard 8 imposes requirements on the council and the fishery management regulatory process that cannot be satisfied given existing data. Current data available do not allow for a meaningful definition of fishing community, moreover, do not provide a measure of dependence upon fishing and will not contribute to useful impact analysis.

At its March meeting, the Gulf of Mexico Fishery Management Council’s Socio-economic Panel recommended that further research be initiated and funded by National Marine Fisheries Service as soon as possible to aid in the identification and definition of fishing communities in the Southeast. The panel also recommended the scope of this problem be addressed at a national level, such that impacts upon fishing communities can be analyzed across regions as well as within. A key area for expanded research is ethnographic and survey research to identify, not only communities, but also those who provide supporting services to the economy and culture of fishing communities. Especially important in the Southeast is the need to provide a realistic portrayal of recreational fishing, diving, and eco-tourism and their importance to a fishing community.

The Council concluded incorporating all available information at this time would meet the mandates of the recent Magnuson-Stevens Act amendments relative to fishing communities.

With the addition of National Standard 8, FMPs must now identify and consider the impacts upon fishing communities to assure their sustainable participation and minimize adverse economic impacts [MSFCMA section 301 (a) (8)].

The proposed guidelines for this new standard state: “... *fishing communities are considered geographic areas encompassing a specific locale where residents are dependent on fishery resources or are engaged in the harvesting or processing of those resources. The geographic area is not necessarily limited to the boundaries of a particular city or town. No minimum size for a community is specified, and the degree to which the community is ‘substantially engaged in’ or ‘substantially dependent on’ the fishery resources must be defined within the context of the geographical area of the FMP. Those residents in the area engaged in the fisheries include not only those actively working in the harvesting or processing sectors, but also ‘fishery-support services or industries,’ such as boat yards, ice suppliers, or tackle shops, and other fishery-dependent industries, such as ecotourism, marine education, and recreational diving.*” [Federal Register Volume 62, Number 149 (August 4, 1997)]

“The term ‘sustained participation’ does not mandate maintenance of any particular level or distribution of participation in one or more fisheries or fishing activities. Changes are inevitable in fisheries, whether they relate to species targeted, gear utilized, or the mix of seasonal fisheries during the year. This standard implies the maintenance of continued access to fishery resources in general by the community. As a result, national standard 8 does not ensure that fishermen would be

able to continue to use a particular gear type, to target a particular species, or to fish during a particular time of the year.” [Federal Register Volume 62, Number 149 (August 4, 1997)]

“The term ‘fishing community’ means a community that is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew, and fish processors that are based in such communities. A fishing community is a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries-dependent services and industries (for example, boatyards, ice suppliers, tackle shops).” [Federal Register Volume 62, Number 149 (August 4, 1997)]

In order to determine a community’s “substantial dependence” or “sustained participation” on fishing, those communities must first be identified. Presently, the NMFS has not identified fishing communities, nor their dependence upon fishing in the South Atlantic. Moreover, there are no ongoing data collection programs to gather the necessary information that would allow for the identification of fishing communities in the South Atlantic or other regions. Also, there are no future plans to implement any such data collection program that would determine dependence upon fishing in order to provide the Councils with important information necessary for social and economic impact analysis of fishing communities. This leaves the councils with existing data collected through other agencies, not always specific to fisheries management, i.e., census data, regional economic census, and previous research on specific fisheries. Although this data can be useful, it is often not specific enough to identify or provide a clear representation of a community and its dependence upon fishing. One reason for this difficulty is that fishermen in a specific fishery often do not reside within one particular municipality that can easily be identified as a fishing community or one that is substantially dependent upon fishing. Also, that information is often not provided at the municipality level, but more often at the county level.

Commercial fishermen may have a domicile (home) in one community and dock their boat in another. They may sell their fish in either place or an entirely different location. Recreational fishermen often do not live on the coast, but drive from inland counties and may launch their boats or fish from several different sites. For these reasons, identifying a “fishing community” becomes problematic in that such a community does not fit the normal geographic boundaries or fall within the metes and bounds that would surround a normal incorporated municipality.

The impacts of fisheries management may be minimal in a single community, but, when taken overall may be substantial to an entire county or several county area. Those same measures may have a small impact on a large metropolitan area, but, to a neighborhood where most fishing families live or most fishing activity originates it could be substantial. Therefore, a “fishing community” may encompass a single municipality, a county, several counties or one neighborhood within a major metropolitan area depending upon a variety of demographic, social, economic and ecological factors that one must consider.

One important circumstance to consider when assessing the impacts upon fishing communities is the difference between rural and urban areas, as many fishing communities exist in rural areas on the Southeast coast. There are several ways in which rural areas differ from the more urban or metropolitan as illustrated in *Understanding Rural America* (ERS-USDA, 1993). Rural areas have consistently lagged behind urban areas with respect to real earnings per job and education levels. Rural areas have also seen a rise in subgroups who are prone to economic disadvantage--families headed by single mothers and minorities. However, these differences vary across the country and are influenced by several factors, one of which is the availability of natural resources. In order to explain and examine some of these differences, counties within the U.S. have been classified as either metropolitan or non-metropolitan. A further subdivision of non-metro counties provides a more clear understanding into each subtype’s dependence upon certain economic

specialization and the importance of those differences to the residents of those counties (ERS-USDA, 1993). The following classification system may also suggest a possible method for defining an area's dependence upon fishing using the appropriate criteria.

Six types of non-metro counties have been classified, three of which are based upon economic specialization - farming, manufacturing and services. The other three county classifications are based upon their relevance to policy -- retirement-destination; Federal lands; and persistent poverty. Using earned income as a measure of dependence, the classification for counties based upon economic specialization is as follows:

Farming counties - 20% or more earned income from farming

Manufacturing - 30% or more earned income from manufacturing

Services - 50% or more earned income from services industries

Those counties whose classification is based upon economic specialization are mutually exclusive; the other three classification types are not mutually exclusive (ERS-USDA, 1993).

This type of classification system, based upon a percentage of earned income or other measure, might be used to determine a community, county or region's dependence upon fishing. However, like farming counties, those dependent upon fishing have likely seen a decline in the dependence upon fishing over time. This is probably due to significant increases in the population of coastal areas since the 1970's. Much of the population growth has been in the form of immigration of people 60 and older who seek coastal areas for retirement destinations. The increase in this population sector, in turn, brings a greater dependence upon service industries. Choosing such a measure of dependence is not possible at this time and would have to be developed through further analysis and/or research.

Griffith and Dyer developed a typology of fishing community dependence for the Northeast Multi-species Groundfish Fishery (MGF) (Aguirre, 1996). In that typology, they identified critical indicators of dependence which included specific physical-cultural and general social-geographic indicators, i.e., number of repair/supply facilities; number of fish dealers/processors; presence of religious art/architecture dedicated to fishing; presence of secular art/architecture dedicated to fishing; number of MGF permits; and number of MGF vessels. Using previous results and supplemental research of their own, they were able to develop a fishery dependence index score for the five primary ports in the MGF.

From their research Griffith and Dyer were able to document five variables which best predicted dependence upon the MGF:

1. Relative isolation or integration of fishers into alternative economic sectors, including political participation. To what extent have the fleets involved in the MGF enclaved themselves from other parts of the local political economy or other fisheries? How much have the MGF fleets become, similar to an ethnic enclave, closed communities?
2. Vessel types within the port's fishery. Is there a predominance of large vessels or small vessels, or a mix of small, medium, and large?
3. Degree of specialization. To what extent do fishers move among different fisheries? Clearly, those fishers who would have difficulty moving into alternative fisheries or modifying their vessels with alternative gears are more dependent on the MGF than those who have histories of moving among several fisheries in an opportunistic fashion.

4. Percentage of population involved in fishery or fishery-related industries. Those communities where between five and ten percent of the population are directly employed in MGF fishing or fishing-related industries are more dependent on the MGF than those where fewer than five percent are so employed.

5. Competition and conflict within the port, between different components of the MGF. Extensive competition and conflict between fishers within the same port--as well as between different actors in the MGF, such as boat owners and captains--seem to be associated with intensive fishing effort and consequent high levels of dependence on the MGF. In this case, dependence may have a strong perceptual dimension, with fishers perceiving the resources they are harvesting to be scarce and that one fleet's gain is another fleet's loss.

It is important to understand that these factors are appropriate for the MGF and are not necessarily the best predictors for all fishing communities. Fisheries in the Southeast will differ markedly from those in other regions of the country, especially with regard to their integration into other economies and notably the tourist economy. Recreational fishing is an integral part of the tourism and service economy that has developed for coastal communities in the South Atlantic. For these communities, dependence upon fishing will undoubtedly be tied to commercial and recreational fishing and their associated businesses. Therefore, it is important for fishery dependence models to be developed specifically for the South Atlantic.

Griffith and Dyer (Aguirre 1996) also discuss their description of fishing communities as it relates to the term Natural Resource Community (NRC). Dyer et. al define a NRC as "a population of individuals living within a bounded area whose primary cultural existence is based upon the utilization of renewable natural resources" (1992:106). Natural Resource Communities possess an elementary connection between biological cycles within the physical environment and socio-economic interactions within the community. An adaptation to working on the water by fishermen has important implications for the community as a whole because of the necessary support activities that take place on land, i.e., net hanging & mending; fish handling & preparation; boat building & repair. This important tie to the physical environment not only dictates occupational participation, but structures community interaction and defines social values for those living in Natural Resource Communities. While fishing communities in the MGF are not bounded or set apart from the larger community in which they reside, they still manifest certain recognizable features that would classify them as NRCs (Aguirre 1996). Fishing communities in the South Atlantic will also show signs of being integrated into the larger economy, but may still maintain certain vestiges of an NRC. Fishermen in the South Atlantic, like those in the Northeast MGF, will not likely see their ecological systems being closed, but affected by a host of other forces, both globally and locally. Far more detailed research will need to be conducted among South Atlantic fishing communities to determine changes in integration of the larger economy. One of the most likely changes will be an increasing dependence upon the service sectors as recreational fishing and other recreational activities play an increasing role in the economies of coastal communities. While there will continue to be a connection between the social and physical environments, the nature of that interaction will undoubtedly change.

At this time there is insufficient data to completely identify and define fishing communities in the South Atlantic. The following description of fishing communities provides information to explore ways of defining fishing communities that range from geographical regions to a well bounded municipality. With varied levels of research or data available for each state, descriptions of fishing communities will depend upon the amount of data available and the specific nature and timeliness of that data. In some cases, it may be possible to find a municipality that will clearly fit a definition of fishing community and meet a criterion for dependence upon fishing. In others, it may

be a series of communities or counties designated a “fishing community” or possibly a particular sector of a large metropolitan area.

Readily available data will be discussed to allow for public input on the best way to identify fishing communities and determine their dependence upon fishing. Following the discussion of fishing communities in the South Atlantic a discussion of data needs and format will provide possible directions for data collection and analysis. The Council welcomes comments on all aspects of incorporating this new national standard, in order to devise a classification system which will assist in assessing the impacts of fishery management upon fishing communities.

4.3.3.1.1 South Atlantic Fishing Communities

According to NMFS, South Atlantic commercial fishermen have harvested well over 250,000 pounds of seafood in each of the years 1995 and 1996 (Table 1). Those landings have represented over \$200,000,000 in harvest value. The value of those landings can become even greater once it diffuses throughout South Atlantic fishing communities as it provides employment and other benefits to other sectors within each community’s economic base.

Table 1. U.S. Domestic Commercial Fishing Landings by Region, 1995 and 1996. Source Fisheries of the United States, 1996.

Region	1995		1996	
	Thousand pounds	Thousand dollars	Thousand pounds	Thousand dollars
New England	592,665	580,957	641,821	564,169
Middle Atlantic	240,413	179,747	241,936	181,869
Chesapeake	845,632	174,229	728,830	158,736
South Atlantic	277,035	238,112	268,990	209,407
Gulf of Mexico	1,464,718	724,619	1,496,875	680,304

Commercial seafood landings also represent other forms of expenditure which have an impact upon fishing communities, such as: fuel, gear, groceries, etc. Support industries like, gas stations, tackle shops, grocery stores all have an investment in the harvesting capability of the local fishing fleet.

As with commercial fishing, recreational fishing activity will also contribute to the economic base of a fishing community as fishermen buy fuel, bait, tackle and food & beverage for fishing trips. Figure 1 demonstrates an increasing trend in recreational fishing trips for most South Atlantic states, but, also substantial variation in the number of trips over time. Such variation can mean significant economic impacts for those communities that rely upon recreational fishing.

South Atlantic fishing communities will depend upon both recreational fishing and commercial fishing for determining the importance of fishing to their economic base. The supporting role of associated businesses will also need to be incorporated into any measure of dependence. Such businesses as: seafood dealers and processors, marinas, gas stations, bait and tackle shops, dive shops, trucking firms, restaurants and many others, all have some role in determining dependence upon fishing. Unfortunately, data that is robust and/or specific enough does not exist to include in such a determination.

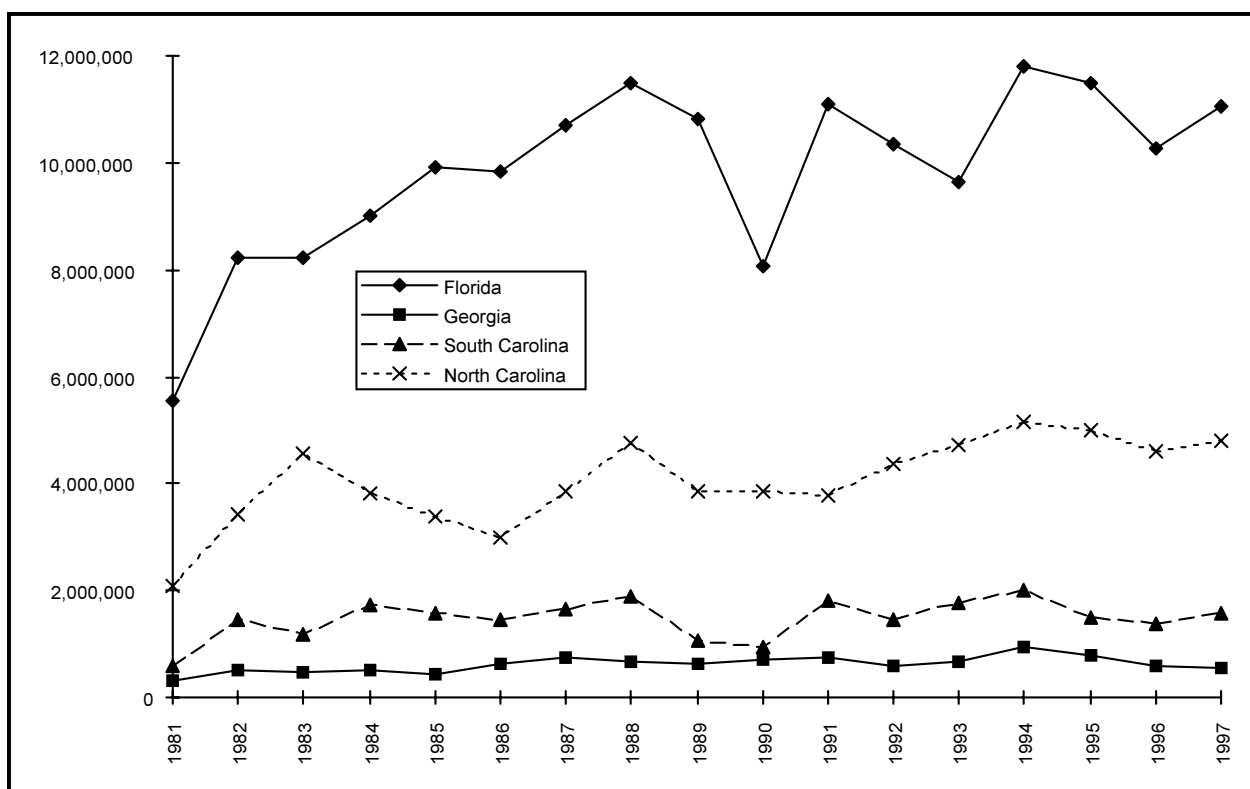


Figure 1. Estimated Number of Marine Recreational Fishing Trips by State and Year for the South Atlantic. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics and Economics Division.

To identify fishing communities in the South Atlantic one might begin with the National Oceanic and Atmospheric Administrations publication *Fisheries of the United States* (1996). Among the various statistics listed are commercial landings of major U.S. ports. These ports could be considered to be substantially dependent upon fishing. Table 2 lists the major ports for the South Atlantic in 1996 and 1995 for quantity and value of landings. Some ports are listed as individual communities while others are a combination of several communities over a limited geographical range. This characterization may be useful as we attempt to further delineate fishing communities in each state. Other sources of information helpful in defining fishing communities include the United States Census and Bureau of Economic Research, which include economic information for many areas of the U.S.

Table 2. Quantity, Value and Rank of Commercial Landings for South Atlantic Ports among Major U.S. Ports Source: Fisheries of the United States, 1996.

Port	1995 Quantity*	1995 Rank	1995 Value*	1995 Rank	1996 Quantity*	1996 Rank	1996 Value*	1996 Rank
Key West	23.4	32	66.7	5	23.7	37	62.8	4
Beaufort-Morehead City, NC	87.0	16	35.0	15	75.4	18	20.3	34
Wanchese-Stumpy Point, NC	39.0	25	25.0	24	43.4	24	24.6	27
Charleston-Mt.Pleasant, SC	11.0	58	19.0	32	---	--	---	--
Cape Canaveral, FL	10.1	--	16.9	35	21.2	43	17.7	42
Darien-Bellville, GA	---	--	11.0	50	---	--	---	--
Beaufort, SC	---	--	11.0	51	---	--	---	--
Englehard-Swanquarter, NC	11.0	58	---	--	15.0	50	---	--
Oriental-Vandemere, NC	9.0	--	10.0	--	14.0	53	13.3	50
Bellhaven-Washington, NC	---	--	6.0	--	---	--	11.5	58

*Value and quantity are in millions of dollars and pounds respectively.

4.3.3.1.2 North Carolina

The 1990 Census of Population and Housing provides the following information for North Carolina regarding individuals who reported their occupation as fisher in Table 3. This data will likely include those individuals who commercially fish fresh water areas and others who are not impacted by fisheries management of marine fisheries at the council level. This information does provide data for comparison and could help set parameters for a measure of dependency upon fishing. It is not recommended that these figures be used to determine dependency upon fishing, however. The 1990 Census classifies year-round full-time workers as all persons 16 years old and over who usually worked 35 hours or more per week for 50 to 52 weeks in 1989.

Table 3. Number of Fishers and Mean Annual Income for North Carolina in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of fishers			
Male	989	1,271	2,260
Female	47	105	152
Total	1,036	1,376	2,412
Mean Annual Income (\$)			
Male	16,315	13,069	14,489
Female	11,518	4,489	6,662
Total	16,097	12,414	13,996

The 1990 Census also provides the following information for North Carolina regarding individuals who reported their occupation as captain of a fishing vessel in Table 4. It is interesting to note that there were no females listed as captain of fishing vessels. This concurs with the much of the research on the occupation of fishing which finds very few women in this role. Although women often play an important role in the fishing operation, they are rarely in the position of captain of fishing vessels.

Table 4. Number of Captains of Fishing Vessels and other officers and Mean Annual Income for North Carolina in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of Captains			
Male	102	141	243
Female	0	0	0
Total	102	141	243
Mean Annual Income (\$)			
Male	26,917	33,640	30,818
Female	0	0	0
Total	26,917	33,640	30,818

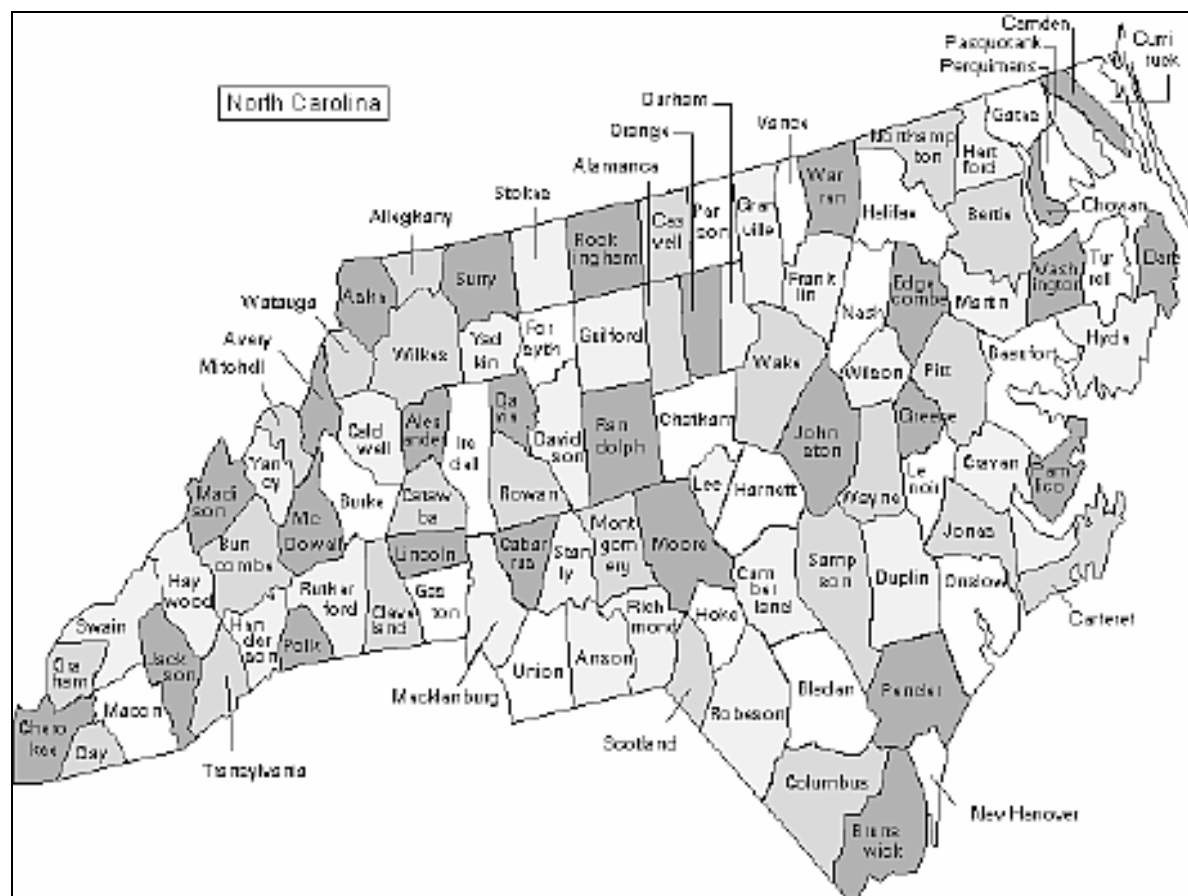


Figure 2. North Carolina Counties. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Johnson and Orbach (1996) have divided North Carolina into six areas for their research on effort management of North Carolina commercial fisheries. Those areas were determined to be distinct with regard to species/gear combinations in addition to sociological, ecological and environmental differences. The areas defined are as follows:

- Area 1: Albermarle Area - Currituck, Camden, Pasquotank, Perquimans, Chowan, Bertie, Washington, and Tyrell Counties.
- Area 2: Dare County

Area 3: Southern Area - Brunswick, Pender, New Hanover, and Onslow Counties
Area 4: Pamlico Area - Craven, Pamlico, Beaufort, and Hyde Counties.
Area 5: Carteret County
Area 6: Inland Counties.

Area 1: Albermarle Area

The Albermarle area includes the following counties: Currituck, Camden, Pasquotank, Perquimans, Chowan, Bertie, Washington and Tyrell. Johnson and Orbach (1997) found that commercial fishermen in this area had two primary gear types, pots and gill nets. They also concluded that fishermen here move in and out of gill netting on an annual basis.

Table 5. Population and Economic Information for Counties included in Area 1. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 1-County		1993	1994	1995
Bertie	Population	20,631	20,665	20,745
	Personal Income (Thousands of \$)	291,226	303,292	328,227
	Per Capita Pers Income (\$)	14,116	14,677	15,822
	Personal Income Fishing (Thousands of \$)	71	75	84
Camden	Population	6,211	6,370	6,399
	Personal Income (Thousands of \$)	92,875	100,012	105,636
	Per Capita Pers Income (\$)	14,953	15,700	16,508
	Personal Income Fishing (Thousands of \$)	0	0	0
Chowan	Population	13,815	13,909	13,958
	Personal Income (Thousands of \$)	226,563	234,453	247,428
	Per Capita Pers Income (\$)	16,400	16,856	17,727
	Personal Income Fishing (Thousands of \$)	128	134	151
Currituck	Population	15,215	15,831	16,285
	Personal Income (Thousands of \$)	251,885	269,871	291,055
	Per Capita Pers Income (\$)	16,555	17,047	17,873
	Personal Income Fishing (Thousands of \$)	358	376	423
Pasquotank	Population	33,220	33,488	33,759
	Personal Income (Thousands of \$)	510,623	534,860	574,433
	Per Capita Pers Income (\$)	15,371	15,972	17,016
	Personal Income Fishing (Thousands of \$)	----	----	----
Perquimans	Population	10,644	10,692	10,737
	Personal Income (Thousands of \$)	148,365	162,627	160,912
	Per Capita Pers Income (\$)	13,939	15,210	14,987
	Personal Income Fishing (Thousands of \$)	----	0	----
Tyrell	Population	3,918	3,875	3,846
	Personal Income (Thousands of \$)	56,056	58,138	52,738
	Per Capita Pers Income (\$)	14,307	15,003	13,712
	Personal Income Fishing (Thousands of \$)	476	500	562
Washington	Population	14,136	14,276	14,138
	Personal Income (Thousands of \$)	220,429	229,038	238,124
	Per Capita Pers Income (\$)	15,593	16,044	16,843
	Personal Income Fishing (Thousands of \$)	225	236	266

Using multidimensional scaling, Johnson and Orbach were able to examine the spatial relationship of various types of fishing in each area. For Area 1, crab potting was the most central fishery. In other words most fishermen in the area do some crab potting. Referring to cliques, they found that for this area fishermen who peeler pot, eel pot, crab pot and gill net flounder differ from

those that long haul. Fishermen that long haul will crab pot and gill net flounder but do not engage in peeler pots or eel pots.

In examining the categories which would include fishermen for Area 1 (Table 6) there seems to be no trend regarding either those in Farm/Fish/Forest occupations or the Agriculture, Fishing, Mining Industries. There are both increases and decreases in the number of those within each categories from 1970 to 1990 which varies by county.

Table 6. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for North Carolina Coastal Counties included in Area 1 for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Bertie County	Farm/Fish/Forest	923	1035	839
	Agri.,Fishing,Mining	1050	1038	884
Camden County	Farm/Fish/Forest	203	220	114
	Agri.,Fishing,Mining	220	181	137
Chatham County	Farm/Fish/Forest	740	904	832
	Agri.,Fishing,Mining	927	934	1286
Currituck County	Farm/Fish/Forest	194	247	316
	Agri.,Fishing,Mining	215	296	309
Pasquotank County	Farm/Fish/Forest	444	491	469
	Agri.,Fishing,Mining	552	478	508
Perquimans County	Farm/Fish/Forest	417	513	299
	Agri.,Fishing,Mining	445	524	316
Tyrrell County	Farm/Fish/Forest	197	249	208
	Agri.,Fishing,Mining	225	273	233
Washington County	Farm/Fish/Forest	408	511	551
	Agri.,Fishing,Mining	462	557	526

Area 2 : Dare County

Within Dare county the following communities have been described through recent research of the snapper grouper fishery and might be considered fishing communities: Manns Harbor, Manteo, Wanchese, Hatteras, Stumpy Point (Iverson 1997). Johnson and Orbach (1997) found that commercial fishermen in this area had two primary gear types, pots and gill nets. In their analysis of fishery networks for Area 2 they again found crab pots to be central. Another interesting difference revealed was that fishermen who shrimp trawl in this area will gillnet for sharks but do not engage in crab potting.

Dare County shows a higher personal income from fishing over the three years listed (Table 7) than most other coastal counties in North Carolina.

Table 7. Population and Economic Information for Counties included in Area 2. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 2				
County		1993	1994	1995
Dare				
	Population	24,300	25,106	26,074
	Personal Income (Thousands of \$)	429,564	465,011	502,474
	Per Capita Pers Income (\$)	17,678	18,522	19,271
	Personal Income Fishing (Thousands of \$)	5,426	5,688	6,392

Dare County (Table 8) shows a general increase in the number of individuals in the listed occupations and industries over the twenty years from 1970 to 1990.

Table 8. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for Dare County (Area 2) for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Dare County	Farm/Fish/Forest	11	376	637
	Agri.,Fishing,Mining	181	446	655

Snapper Grouper Fishing

Most of the snapper grouper permit holders in Area 2 work out of Hatteras and only a small portion of their annual commercial fishing activity is devoted to targeting snapper grouper species. Black sea bass, snowy grouper, and blueline tilefish are the most frequently targeted species by commercial snapper grouper fishermen from this area. Surface longlining for tuna and swordfish is apparently the most productive and profitable style of commercial fishing in the area, and the small towns of Manteo and Wanchese serve as refuge for a large number of both local and non-local longlining boats (Iverson, 1997).

Area 3: Southern Area

The Southern Area includes the following counties and communities (in parenthesis): Brunswick (Southport). Pender, New Hanover, Onslow (Sneads Ferry). Johnson and Orbach (1997) found that commercial fishermen in this area had four primary gear types: hook-and-line, gill net, hand harvest of shellfish, and trawling. Pot fishing was classified as secondary gear but they report that increasing usage over time could possibly make it a primary gear. It is interesting to note that they also reported that pot fishing showed an increase in all five areas over time. Area 3 showed much more complexity in annual rounds of fishing than Areas 1 or 2 with shrimp trawling, hand clamming and crab potting all central to the network (Johnson and Orbach 1997).

Table 9. Population and Economic Information for Counties included in Area 3. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 3				
County		1993	1994	1995
Brunswick	Population	56,350	58,386	60,697
	Personal Income (Thousands of \$)	878,453	941,247	1,024,954
	Per Capita Pers Income (\$)	15,589	16,121	16,886
	Personal Income Fishing (Thousands of \$)	1,595	1,674	1,885
Pender	Population	32,554	33,894	33,759
	Personal Income (Thousands of \$)	510,623	534,860	574,433
	Per Capita Pers Income (\$)	15,681	16,341	17,253
	Personal Income Fishing (Thousands of \$)	----	----	----
New Hanover	Population	131,091	135,317	139,906
	Personal Income (Thousands of \$)	2,620,539	2,800,024	3,036,665
	Per Capita Pers Income (\$)	19,990	20,692	21,705
	Personal Income Fishing (Thousands of \$)	----	----	693
Onslow	Population	145,638	144,951	144,259
	Personal Income (Thousands of \$)	1,962,312	2,030,075	2,149,074
	Per Capita Pers Income (\$)	13,474	14,005	14,897
	Personal Income Fishing (Thousands of \$)	667	700	787

Counties included in Area 3 (Table 10.) show a general increase in numbers of individuals within the selected occupations and industries, with the exception of Pender County which shows a decline from 1970-1990.

Table 10. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for North Carolina Coastal Counties included in Area 3 for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database.

County	Occupation/Industry	1970	1980	1990
Brunswick County	Farm/Fish/Forest	370	668	1028
	Agri.,Fishing,Mining	505	645	971
Pender County	Farm/Fish/Forest	772	562	627
	Agri.,Fishing,Mining	892	669	690
New Hanover County	Farm/Fish/Forest	289	550	782
	Agri.,Fishing,Mining	564	615	984
Onslow County	Farm/Fish/Forest	754	869	996
	Agri.,Fishing,Mining	906	800	987

Snapper Grouper Fishing

For Area 3, the small community of Sneads Ferry, is unique in that the majority of the commercial reef fishermen fish with sea bass pots. According to the 1993 federal permit list for the South Atlantic region, there were 58 permit holders who indicated that sea bass pots were their primary gear type. Of those, 13 permit holders worked out of Sneads Ferry (Iverson, 1997). Overall, 72% of fishermen using sea bass pots as their primary gear work out of home ports in North Carolina.

Area 4: Pamlico Area.

The Pamlico area includes these counties and communities (in parenthesis): Craven, Pamlico (Vandemere, Oriental), Beaufort (Bellhaven, Washington), Hyde (Ocracoke, Swanquarter, Englehard). Johnson and Orbach (1997) found that commercial fishermen in this area had three primary gear types, pots, gill nets, and trawls. In terms of annual fishing rounds Area 4 is the simplest to understand where two strategies are employed: gill netting and crab potting or trawling and crab potting. They go on to note that this simple strategy may signify few choices for fishermen in this area in the case of environmental or regulatory change (Johnson and Orbach 1997). Possible fishing communities within Area 4 might be: Vandemere and Oriental.

Pamlico county had the highest personal income from fishing for Area 4 from 1993 to 1995 with a steady increase over those three years (Table 11). Hyde county followed with Beaufort next; both showing an increase over time. For most counties in Area 4 (Table 12) the general trend seems to be an increase from 1970 to 1980 and then a decrease from 1980 to 1990 within these occupation and industry categories. Beaufort County shows an overall decrease from 1970-1990.

Table 11. Population and Economic Information for Counties included in Area 4. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 4				
County		1993	1994	1995
Craven				
	Population	83,595	83,851	85,163
	Personal Income (Thousands of \$)	1,450,296	1,508,353	1,626,657
	Per Capita Pers Income (\$)	17,349	17,988	19,101
	Personal Income Fishing (Thousands of \$)	386	405	- - - -
Pamlico				
	Population	11,772	11,948	12,064
	Personal Income (Thousands of \$)	179,384	186,131	199,576
	Per Capita Pers Income (\$)	15,238	15,578	16,543
	Personal Income Fishing (Thousands of \$)	2,714	2,851	3,211
Beaufort				
	Population	43,446	43,815	43,998
	Personal Income (Thousands of \$)	674,788	711,961	756,048
	Per Capita Pers Income (\$)	15,532	16,249	17,184
	Personal Income Fishing (Thousands of \$)	1,339	1,406	1,580
Hyde				
	Population	5,374	5,339	5,362
	Personal Income (Thousands of \$)	80,982	90,101	80,300
	Per Capita Pers Income (\$)	15,069	16,876	14,976
	Personal Income Fishing (Thousands of \$)	1,860	1,973	2,215

Table 12. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for North Carolina Coastal Counties included in Area 4 for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Craven County	Farm/Fish/Forest	873	1136	832
	Agri.,Fishing,Mining	1129	1222	860
Pamlico County	Farm/Fish/Forest	245	498	442
	Agri.,Fishing,Mining	502	662	477
Beaufort County	Farm/Fish/Forest	1452	1393	1024
	Agri.,Fishing,Mining	2169	2123	1190
Hyde County	Farm/Fish/Forest	295	509	454
	Agri.,Fishing,Mining	442	579	511

Area 5: Carteret County

In Area 5 Johnson and Orbach (1997) found that commercial fishermen had three primary gear types, gill nets, trawls and hand harvest of shell fish. In terms of annual fishing rounds Area 5 did not show the clear gear stratification found in other areas. Shrimp trawling is the most central fishery, but pound netting, crab potting, and mechanized clamming also occur with shrimp trawling. (Johnson and Orbach 1997). Possible fishing communities within Area 5: Morehead City and Beaufort.

Table 13. Population and Economic Information for Counties included in Area 5. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

Area 5				
County		1993	1994	1995
Carteret				
	Population	55,747	56,381	57,690
	Personal Income (Thousands of \$)	935,032	985,484	1,076,753
	Per Capita Pers Income (\$)	16,773	17,479	18,664
	Personal Income Fishing (Thousands of \$)	2,783	2,871	3,207

Among North Carolina's coastal counties, Carteret county was second to Dare county (Table 13) in terms of personal income from fishing. In addition, Carteret County (Table 14) shows an marked increase from 1970 to 1980, then a decrease from 1980 to 1990, within the occupations of Farm/Fish/Forest and an overall increase in the number of Agriculture, Fishing and Mining industries.

Table 14. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for Carteret County (Area 5) for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database.

County	Occupation/Industry	1970	1980	1990
Carteret County	Farm/Fish/Forest	225	1200	1158
	Agri.,Fishing,Mining	731	1234	1260

In a recent report on the importance of commercial fishing in Carteret county, Diaby (1997) found that Carteret county ranked first in poundage (96,652,314 lb) and second in dockside value (\$20,618,486) in terms of commercial landings for North Carolina coastal counties. Finfish represented the 91% of total landings and 46% of total ex-vessel value. The most important species of finfish were: menhaden, flounder, croaker, weakfish and spot. Shellfish and crustaceans accounted for only 9% of all commercial landings but, represented over half of the value of landings during the period from 1974-1994. Employment by the commercial fishing industry, both full and part time for Carteret county was estimated to be 3,232 people for 1994 (Diaby, 1997). This number varies from those reported in the census data and emphasizes the problems in comparing these types of data. Since 1981 there have been about 105 to 140 licensed seafood dealers in Carteret county. The value of processed seafood peaked for the county in 1981 when scallops accounted for almost half of the value with a total value of \$19,737,126. Since that time there has been a general decline in total value of processed seafood attributable to a decline in scallop landings. Menhaden was the most important single processed product over a fifteen year period from 1980 to 1994 (Diaby, 1997).

In estimating the economic impact of Carteret county commercial harvesting sector Diaby (1997) estimated \$27 million in sales of goods and services and \$11.66 million in value added. Total employment from commercial harvesting activities was estimated to be 3,371.

Sales of goods and services for the wholesaling and processing sector were estimated at \$19 million, with \$11 million in value added. There were an estimated 1,563 full and part time jobs created earning \$6.55 million in wages (Diaby, 1997).

Overall, the activities of the commercial fishing industry created \$46 million in sales of goods and services and \$24 million in value added. There were 4,934 full and part time jobs which earned \$14 million in wages (Diaby, 1997).

The recreational fishery spent approximately \$70 million on fishing trips in Carteret county with \$25.23 million in employ compensation and \$47.61 in value added. There were 1,821 full and part time jobs associated with the recreational fishing industry in Carteret County.

The total impact of the coastal fishing industry on the economy of Carteret County was estimated to be \$120.74 million with \$71.32 million in value added. The total number of full and part time jobs was estimated at 6,755 with earnings of \$38.94 (Diaby, 1997).

Snapper Grouper Fishing

The Morehead City/Beaufort area is located approximately 50 miles south of Ocracoke in Carteret County. This area is known for its sportfishing activity including several major tournaments each year. There is a small population of full time commercial reef fishermen in Morehead, however the majority of fishermen holding commercial permits are primarily part timers. Many of these fishermen divide their time between charter fishing during the peak tourist season (April through September) and commercial fishing in the winter months. Full time fishermen in this area reported fishing approximately 50 miles straight offshore and fishing from Hatteras to as far south as the South Carolina/Georgia line. Trip lengths vary with the size of the vessel, but the average trip length is 7 days and the larger boats carried up to 3 crew members (Iverson, 1997).

King Mackerel Fishery

The king mackerel fishery in North Carolina has grown steadily since 1980 and has leveled with catches repeatedly around one million pounds in recent years. From 1986 to 1990 the number of permits for Atlantic group king mackerel issued in North Carolina ranged from a low of 325 in 1987/88 to a high of 533 in 1989/90. Again, the majority of those permits were granted to hook and line fishermen. Present data indicates there were 448 commercial vessels permitted for king and Spanish mackerel in North Carolina (Vondruska, 1997).

4.3.3.1.3 South Carolina

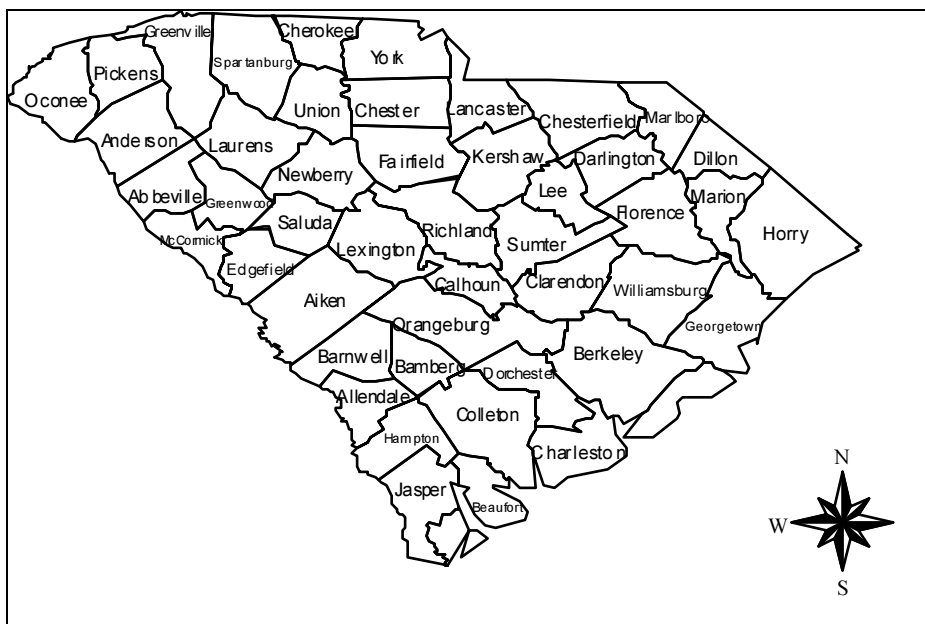


Figure 3. South Carolina Counties Source: Roger Pugliese, SAFMC Staff.

The 1990 Census of Population and Housing provides the following information for South Carolina regarding individuals who reported their occupation as fisher in Table 15. A total of 401 individuals claimed Fisher as their occupational title with less than half indicating it was a year

round full time employment. There were few females who indicated such and they had a far lower mean annual income than males in this occupation.

Table 15. Number of Fishers and Mean Annual Income for South Carolina Fishers in 1990.

Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of fishers			
Male	188	193	381
Female	6	14	20
Total	194	207	401
Mean Annual Income (\$)			
Male	28,842	14,489	18,946
Female	750	5,000	2,403
Total	23,710	14,269	18,390

There were a total of 69 individuals who indicated their occupation as captain of a fishing vessel in the 1990 census of population and housing, and 7 of them were female according to Table 16. Again, females had a much lower mean annual income when compared to males.

Table 16. Number of Captains of Fishing Vessels and other officers and Mean Annual Income for South Carolina in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of Captains			
Male	17	45	62
Female	7	0	7
Total	24	45	69
Mean Annual Income (\$)			
Male	18,765	15,022	16,048
Female	9,000	0	9,000
Total	15,917	15,022	15,333

Horry County

The following descriptions for fishing communities in South Carolina are notes from Kim Iverson of South Carolina Department of Natural Resources. Kim has spent many months interviewing both commercial and recreational fishermen in South Carolina and other parts of the South Atlantic region as part of several research projects. Although the research was not intended to identify fishing communities, her notes represent the best available information on fishing communities for South Carolina.

Little River has a long history of fishing activity, both commercial and recreationally. The headboat operations date back to the 1940's. As of 1996, there were headboats operating in Little River. There are approximately 4 vessels that actively run charters and also commercial fish. Several full time snapper/grouper vessels operate out of the area. Little River also hosts an annual Blue Crab Festival each spring (Kim Iverson, SCDNR pers. comm., 1998).

Murrells Inlet has a large fleet of charter and headboats, with one marina hosting one of the Governor's Cup Billfishing Tournaments. There are several smaller fishing tournaments held in the area. There are fish houses in the community that deal primarily with finfish. There are no shrimp

dealers. This area is also noted for it's large number of seafood restaurants that target the tourist market from Myrtle Beach (Kim Iverson, SCDNR pers. comm., 1998).

Major fishing tournaments held in Murrells Inlet are: March of Dimes Annual Flounder Tournament - Voyagers View Marina. Registration was by angler with approximately 200 anglers participating. Local tournament with many family participants. Primarily smaller boats < 25' participating. Tournament date May 17.; and the Marlin Quay Governor's Cup Billfish Tournament - Marlin Quay Marina. The last in the series of SC Gov. Cup. Total of 31 boats registered. July 23-26 (Kim Iverson, SCDNR pers. comm., 1998).

Major tournaments in North Myrtle Beach: Dock Holidays Governor's Cup Billfish Tournament - Dock Holiday's Marina. The first tournament in a series of 6 for the SC Governor's Cup. April 30 - May 3. Total of 25 boats entered; Frantic Atlantic King Mackerel Tournaments - North Myrtle Beach - Blue Marlin Yacht & Fishing Club. A two tournament series consisting of the Spring and Fall Classics. Total purse of \$250,000 for the series. Total of 392 paid boat entries with an average of 4.09 anglers per boat. Tournament dates May 9-11, September 26-28; Evinrude Outboard King Mackerel Tournament - Oct. 11-12, Weigh-in stations at Dock Holidays Marina, Marlin Quay Marina and Georgetown Landing. 147 boats were registered; Yamaha Contender King Mackerel Classic - Weigh in stations at Dock Holidays Marina, Marlin Quay Marina and Georgetown Landing. 125 boats registered; Fall Pier King Tournament - September 19-21 (Kim Iverson, SCDNR pers. comm., 1998).

One of the largest concentration of snapper grouper vessels is located in Murrells Inlet, SC. Most of the reef fishermen in this area are full time commercial fishermen and consider bandit reels to be the most effective way of catching snapper grouper. There is a wide variety of snapper grouper species off of Murrells Inlet, with gag grouper, scamp grouper and vermilion snapper being highly targeted. The average trip length is 5 days with some of the larger boats (>40 ft.) fishing up to 10 days. A few smaller bandit boats may stay out for 2-3- days. The Gulf Stream is approximately 62 miles offshore from Murrells Inlet. Most bandit boats fish between the 20-50 fathom line, concentrating on the 25 fathom curve. Winter weather dictates that fishermen fish shallow, in waters 60-90' deep. Several fishermen switch to sea bass trapping during the winter months (Iverson, 1997).

Horry County has shown a small increase in personal income from fishing that follows the general increase in personal income overall (Table 17).

Table 17. Population and Economic Information for Horry County, South Carolina. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Horry				
	Population	148,385	152,435	157,834
	Personal Income (Thousands of \$)	2,543,793	2,744,260	3,013,059
	Per Capita Pers Income (\$)	17,143	18,177	19,220
	Personal Income Fishing (Thousands of \$)	81	129	169

Vessels in Murrells Inlet will fish an area from Frying Pan Shoals off southern NC, south to Savannah. The average boat has two crew members. It is interesting to note that fishermen stated a crew of 3 plus the captain was ideal for this area, but decreasing catches and increased costs have made it necessary to cut back on crew members (Iverson, 1997).

Georgetown County

The community of Georgetown has shrimp dealers who also deal in finfish and shellfish. Georgetown is host to the one of the SC Governor's Cup Billfish Tournaments along with several

other smaller fishing tournaments. There are no headboats operating from the area and charter activity is limited. Georgetown is known for it's historic waterfront district (Kim Iverson, SCDNR pers. comm., 1998).

Major fishing tournaments in Georgetown County: Georgetown Landing Governor's Cup Billfishing Tournament - May 21-24, Georgetown Landing Marina. The oldest of the series tournaments with 45 boats participating.

Georgetown County shows an increasing personal income from fishing like Horry County in Table 18 but, personal income from fishing tends to be a larger percentage of overall personal income than in Horry County.

Table 18. Population and Economic Information for Georgetown County, South Carolina.
Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Georgetown				
	Population	49,371	49,966	50,835
	Personal Income (Thousands of \$)	822,317	885,024	946,898
	Per Capita Pers Income (\$)	16,656	17,713	18,627
	Personal Income Fishing (Thousands of \$)	246	388	399

Charleston County

McClellanville is a small community with a long history of commercial shrimping. McClellanville has a large shrimp fleet. At any given time (dependent upon the season) there can be as many as 20 shrimp boats at the docks. Shrimp wholesale dealers are also present within the community. McClellanville hosts an annual Blessing of the Fleet Festival each spring. Shem Creek (Mt. Pleasant) hosts a mixture of commercial and recreational fishing activity along with a number of seafood restaurants, a retail seafood market and a waterfront hotel. There are also headboats operating out of Shem Creek along with charter operations. There is a large permanent shrimp fleet and many shrimp boats visit seasonally. At any give time there are an average of 30 shrimp boats along the creek. Shrimp dealers along the creek also buy and sell finfish from the trawlers. There are several offshore fishing boats including longline and snapper/grouper boats. Several shellfishermen and crabbers do business along the creek. Each spring, Mt. Pleasant hosts an Annual Blessing of the Fleet for the shrimp boats.

In Folly Beach there is a concentration of commercial fishing vessels and several fish houses who handle offshore finfish, shellfish, shrimp and crabs. Rockville is a historical small community located at the south end of Wadmalaw Island. There are commercial dealers who handle shrimp, inshore fish, offshore finfish and some shellfish. On Edisto Island there are several commercial seafood dealers. There are approximately 10 shrimp boats that operate there, fluctuating with the season. The dealers handle primarily shrimp and in-shore species along with shellfish and blue crabs. There is also a large "harvest" of horseshoe crabs. These crabs are "bled" for their blood that is used in cancer research and returned to the water. Edisto Island is also host to the annual SC Governor's Cup Billfish Tournament. Charter activity here is limited. Bennett's Point is a small community south of Edisto with shrimping operations in the community. There are 10-15 small boat shrimpers that live in Walterboro and fish out of Bennett's Point (Kim Iverson, SCDNR pers. comm., 1998).

Table 19. Population and Economic Information for Charleston County, South Carolina.

Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Charleston	Population	297,888	287,139	281,068
	Personal Income (Thousands of \$)	5,653,489	5,879,506	6,083,636
	Per Capita Pers Income (\$)	18,979	20,476	21,645
	Personal Income Fishing (Thousands of \$)	3,188	3,809	----

Charleston County (Table 19) has a higher personal income from fishing than the previous two counties, but has a much larger overall dollar value for personal income overall.

Major fishing tournaments in the Charleston County area: SCSSA (South Carolina Saltwater Sportfishing Assoc.) Early Bird - Ashley Marina. Approximately 25 registered boats. April 19. Multi-species tournament; James Island King Mackerel Tournament - James Island Yacht Club, May 24; Wild Dunes Governor's Cup Billfish - June 11-14. Total of 46 registered boats; Bohicket Invitational Governor's Cup Billfish - June 25-28. Total of 48 registered boats. Bohicket Marina on John's Island; Lowcountry Angler's Inshore Tournament - June 28. Multi-species tournament held at the East Cooper Outboard Motor Club on Gold Bug Island in Mt. Pleasant. Registration by angler, with approximately 200 anglers registered; SCSSA Sailfish XV - Ashley Marina in Charleston. Club sponsored tournament with approximately 25 boats registered. Sailfish, tuna, dolphin & wahoo. August 8-10; Fishing For Miracles King Mackerel Tournament - Ripley's Light Marina. Large King tournament with over 200 boats entered. August 14-16; Alison Oswald, Sr. Memorial Tournament - James Island Yacht Club. Local tournament with approximately 75 boats participating. Multi-species. Aug. 23; Edisto Marina Governor's Cup Billfish Tournament - July 16-19. One of the oldest and largest of the Billfish Series. 46 Boats registered. Edisto Island (Kim Iverson, SCDNR pers. comm., 1998).

Beaufort County

In Frogmore there are 8 commercial dealers which are home to over 50 shrimpers. This does not include the many individuals with shrimp boats in their back yards. The dealers primarily handle shrimp but others may also handle crabs and shellfish. There is a large blue crab industry on nearby Lady's Island. There are several commercial seafood dealers in the Port Royal area with over 30 shrimp boats. There are also commercial crabbers, shad fishermen and offshore finfishermen here. There are a small number of charter vessels operating out of this area also. Hilton Head Island primarily caters to the tourist trade. There are several headboats operating on Hilton Head. These boats make half-day trips and night trips for shark fishing. There are four major marinas that offer charter fishing. Commercially, Hilton Head had 4 seafood dealers and approximately 12-15 shrimp boats (Kim Iverson, SCDNR pers. comm., 1998).

Data on personal income from fishing in Table 20 for Beaufort County may have been excluded due to confidentiality issues.

Major fishing tournaments in Beaufort County: 42nd Annual Beaufort County Water Festival Fishing Tournament - June 28. Held in conjunction with the annual Beaufort Water Festival; Hilton Head Kingfish Classic - Schillings Marina, Hilton Head Island. July 10-12. Registration by angler with a total of 49 registered; Dottie Dunbar Women's Tournament - Palmetto Bay Marina, Hilton Head. Women's only multi-species inshore tournament. Total of 49 anglers registered. October 4 (Kim Iverson, SCDNR pers. comm., 1998).

Table 20. Population and Economic Information for Beaufort County, South Carolina.

Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Beaufort				
	Population	94,375	97,293	100,017
	Personal Income (Thousands of \$)	2,057,250	2,194,774	2,373,921
	Per Capita Pers Income (\$)	21,799	22,558	23,774
	Personal Income Fishing (Thousands of \$)	----	----	----

Possible fishing communities in South Carolina: Charleston, Mt. Pleasant, Hilton Head, Port Royal, Frogmore (St. Helena), Bennett's Point, Edisto Beach, Rockville, Folly Beach, Shem Creek, McClellanville, Georgetown Waterfront, Murrell's Inlet, Little River (most of these locations are designated ports of landing)

Counties in South Carolina have seen a general increase in these occupations and industries over the past three decades (Table 21), with the exception of Horry County which has seen a slight decreasing trend.

Table 21. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for South Carolina Coastal Counties for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Horry County	Farm/Fish/Forest	2627	2542	2310
	Agri.,Fishing,Mining	2843	2653	2110
Georgetown County	Farm/Fish/Forest	403	558	597
	Agri.,Fishing,Mining	552	856	690
Charleston County	Farm/Fish/Forest	810	1697	2056
	Agri.,Fishing,Mining	1256	1938	2316
Beaufort County	Farm/Fish/Forest	436	938	966
	Agri.,Fishing,Mining	698	1087	1111
Colleton County	Farm/Fish/Forest	532	614	730
	Agri.,Fishing,Mining	787	705	782

For the Charleston, South Carolina MSA (Table 22) there are 113 individuals who indicated fishing as their year round occupation . Another 102 individuals indicated that it is a part time or seasonal occupation for them. This represents over half of those individuals in South Carolina who indicated the occupation as fishing from Table 15. The Charleston, SC MSA includes Berkely, Charleston and Dorchester counties.

Table 22. Number of Individuals in Occupation of Fishing By Work Status and Gender for the Charleston, SC MSA in 1989. Source: 1990 Census Of Population And Housing.

	Year Round Full Time	Other	Total
Male	102	102	204
Female	11	0	11
Total	113	102	215

4.3.3.1.4 Georgia

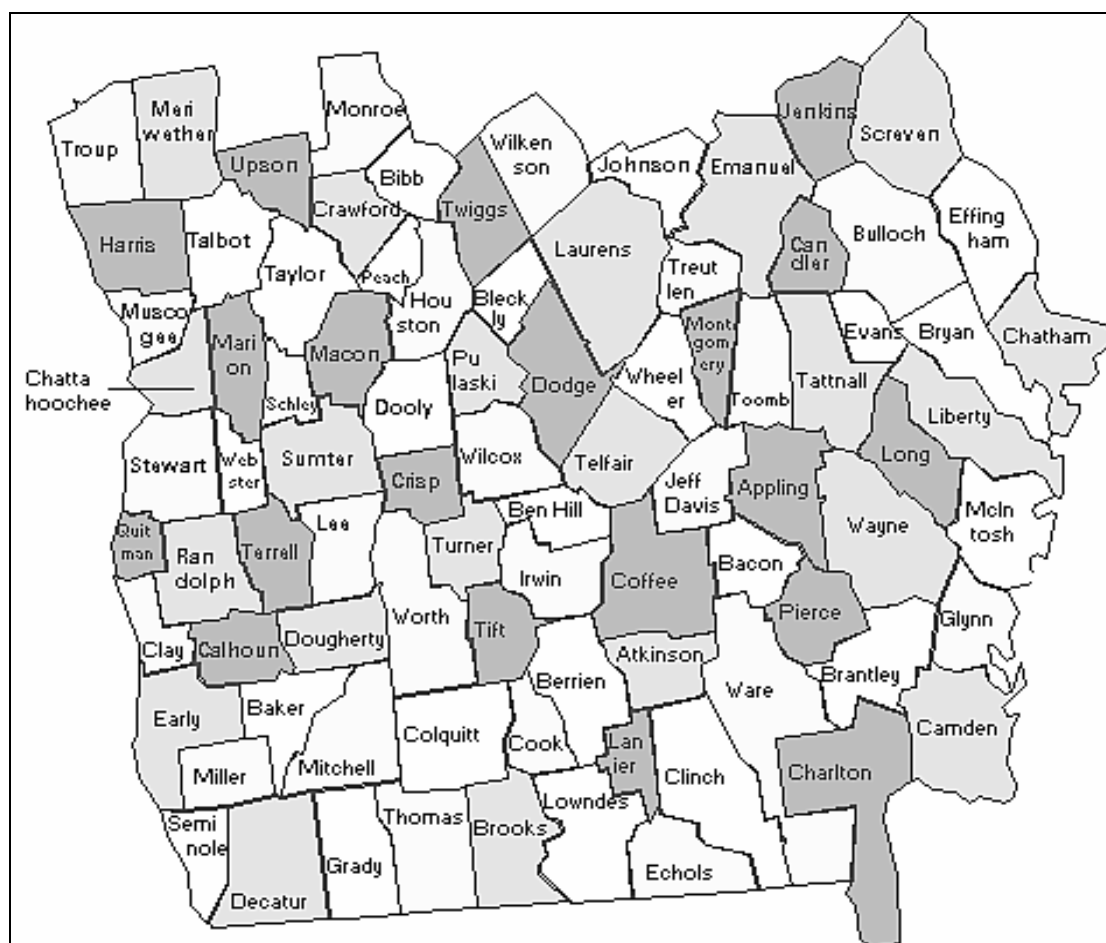


Figure 4. Georgia Coastal Counties. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

The 1990 Census of Population and Housing provides the following information for Georgia regarding individuals who reported their occupation as fisher in Table 23. A total of 536 individuals claimed Fisher as their occupational title with less than half indicating it was a year round full time employment. There were few females who indicated such and they had a far lower mean annual income than males who indicated it was a full time occupation. However, females who indicated it was other than full time had a much higher mean income than any other category. This may be due to a low sample size, however.

Table 23. Number of Fishers and Mean Annual Income for Georgia in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of fishers			
Male	222	295	518
Female	11	7	18
Total	234	302	536
Mean Annual Income (\$)			
Male	19,139	11,082	15,058
Female	8,600	25,000	20,080
Total	18,813	12,024	15,308

Shrimping

In their 1975 report, Nix et. al., found a total of 32 commercial docks in six Georgia coastal counties. Those docks and shrimp trawlers were distributed as follows: Camden Co. - 5 docks and 33 trawlers; Glynn Co. - 5 docks and 74 trawlers; McIntosh Co. - 12 docks and 111 trawlers; Liberty Co. - 1 dock and 18 trawlers; Bryan Co. - 1 dock and 2 trawlers; and finally Chatham Co. - 8 docks and 69 trawlers. This information is outdated and certainly does not represent the current status and location of shrimp trawlers in Georgia. However, the report does represent the kinds of information that can be extremely helpful in identifying fishing communities.

Snapper Grouper Fishing

The coast of Georgia contains a small concentration of full-time reef fishermen that fish primarily with bandit reels. Their fishing patterns are similar to those found in SC with vessels fishing from northern Florida north to the SC/NC line (Iverson, 1997).

Possible fishing communities in Georgia: Savannah, Brunswick, St. Marys, Jekyll Island, and Darien.

Table 24. Number of Captains of Fishing Vessels and other officers and Mean Annual Income for Georgia in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of Captains			
Male	17	21	38
Female	0	0	0
Total	17	21	38
Mean Annual Income (\$)			
Male	25,706	1,976	12,592
Female	0	0	0
Total	25,706	1,976	12,592

Table 25. Population and Economic Information for Chatham County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Chatham	Population (number of persons)	224,050	225,779	226,554
	Personal income (thousands of dollar	4,569,113	4,810,530	5,087,638
	Per capita personal income (dollars)	20,393	21,306	22,457
	Personal Income Fishing (Thousands of \$)	650	(D)	25

Table 26. Population and Economic Information for Bryan County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Bryan				
	Population	18,827	20,008	21,212
	Personal Income (Thousands of \$)	274,738	307,258	342,128
	Per Capita Pers Income (\$)	14,593	15,357	16,129
	Personal Income Fishing (Thousands of \$)	251	359	- - - -

Table 27. Population and Economic Information for Liberty County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Liberty				
	Population	56,625	58,827	58,571
	Personal Income (Thousands of \$)	636,042	669,454	709,468
	Per Capita Pers Income (\$)	11,233	11,380	12,113
	Personal Income Fishing (Thousands of \$)	- - - -	90	97

Table 28. Population and Economic Information for McIntosh County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
McIntosh				
	Population	8,985	9,153	9,372
	Personal Income (Thousands of \$)	110,187	116,171	125,645
	Per Capita Pers Income (\$)	12,263	12,692	13,406
	Personal Income Fishing (Thousands of \$)	3,619	4,486	- - - -

Table 29. Population and Economic Information for Glynn County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Glynn				
	Population	64,759	64,956	65,450
	Personal Income (Thousands of \$)	1,322,745	1,400,544	1,505,337
	Per Capita Pers Income (\$)	20,426	21,558	23,000
	Personal Income Fishing (Thousands of \$)	328	343	351

Table 30. Population and Economic Information for Camden County, Georgia. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Camden				
	Population	39,712	41,262	40,819
	Personal Income (Thousands of \$)	502,639	542,385	556,622
	Per Capita Pers Income (\$)	12,657	13,145	13,636
	Personal Income Fishing (Thousands of \$)	1,889	2,431	2,484

Georgia coastal counties have seen a general increase in these occupations and industries with the exception of Liberty County which has shown a decrease from 1970-1990.

Table 31. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for Georgia Coastal Counties for 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Bryan County	Agri.,Fishing,Mining	161	100	200
	Farm/Fish/Forest	121	135	136
Chatham County	Agri.,Fishing,Mining	558	686	1103
	Farm/Fish/Forest	228	704	1062
Liberty County	Agri.,Fishing,Mining	332	146	152
	Farm/Fish/Forest	242	205	157
McIntosh County	Agri.,Fishing,Mining	233	266	169
	Farm/Fish/Forest	27	260	193
Glynn County	Agri.,Fishing,Mining	261	482	593
	Farm/Fish/Forest	84	581	712
Camden County	Agri.,Fishing,Mining	209	126	176
	Farm/Fish/Forest	106	110	205

4.3.3.1.5 Florida

Florida's eastern coastline is made up largely of metropolitan counties. This is primarily due to the increases in population for Florida's coastal counties over the past 50 years. Florida's coastline has become a very popular retirement destination and tourist attraction. Because they are largely metropolitan, fishing communities here may be subsumed into these larger metropolitan areas and difficult to identify. Data presented from the most recent Census will also show that in relation to the larger economy, fishing will contribute very little at the county level for most coastal counties. Over the years, with the demographic changes following the immigration of retirees and tourists and the subsequent economic transition, few fishing communities will have survived as distinct communities.

The data presented in Table 32 shows Florida as having almost 6,000 individuals claiming fisher as their occupation in the 1990 census; 381 of those individuals were female. Mean annual income is highest for those reporting fishing as a full time occupation with women reporting a lower mean annual income in all categories.

Table 32. Number of Fishers and Mean Annual Income for Florida in 1990. Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of fishers			
Male	2,698	2,844	5,544
Female	111	270	381
Total	2,809	3,116	5,925
Mean Annual Income (\$)			
Male	23,288	11,794	17,388
Female	17,285	11,511	13,193
Total	23,051	11,770	17,118

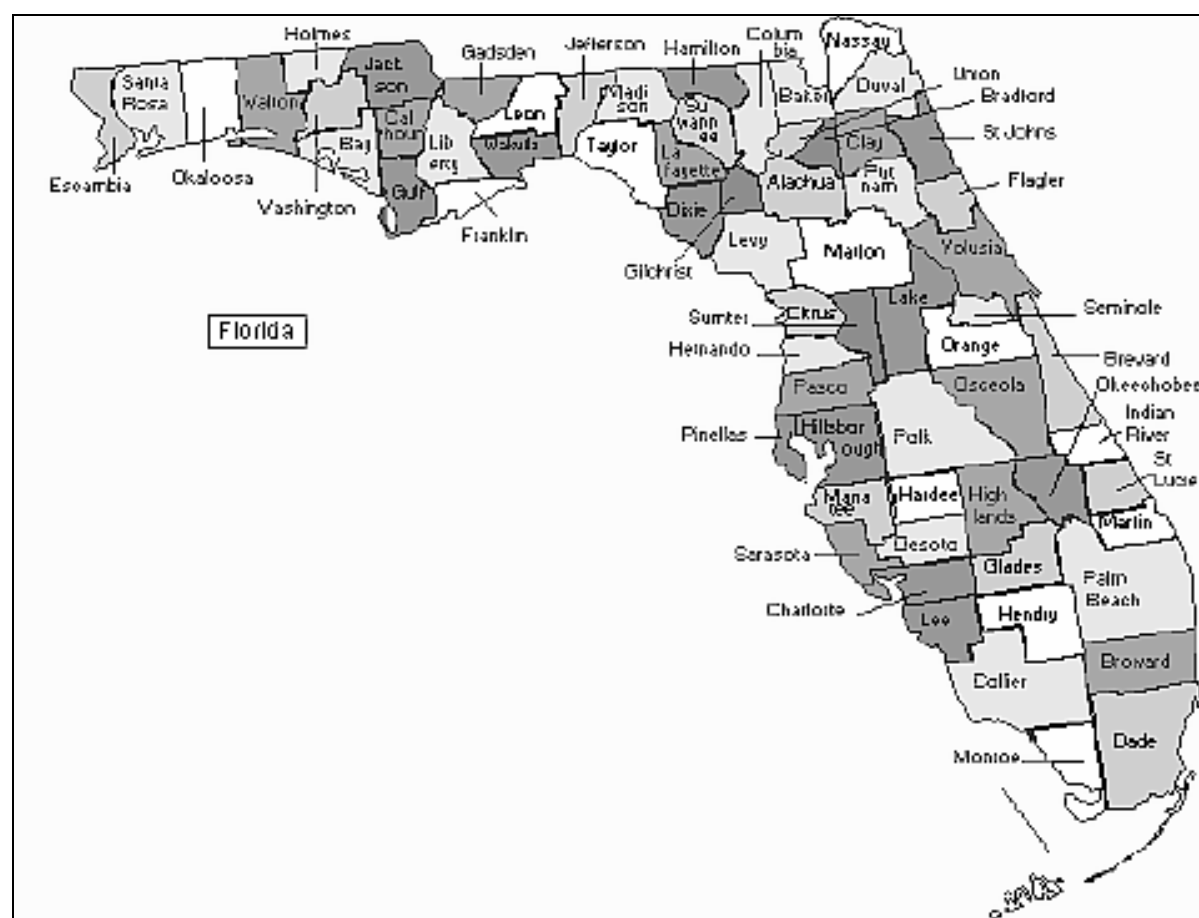


Figure 5. Florida Coastal Counties. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

There were over 1100 individuals from Florida who reported their occupation as captain of a fishing vessel during the 1990 census, with 51 of them being female (Table 33). Again, mean annual income was highest for full time workers and females reported lower mean annual income for both full time and other work.

Table 33. Number of Captains of Fishing Vessels and other officers and Mean Annual Income for Florida in 1990 Source: U.S. Bureau of the Census.

	Year Round/Full Time	Other	Total
Number of Captains			
Male	430	633	1,063
Female	26	25	51
Total	456	658	1,114
Mean Annual Income (\$)			
Male	25,993	21,274	23,183
Female	8,487	15,420	11,885
Total	24,995	21,052	22,666

Nassau County (Table 34) showed an increase in personal income from fishing over the time period from 1993 to 1995 which reflects the general increase in population and personal income overall for the county.

Table 34. Population and Economic Information for Nassau County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Nassau				
	Population	48,355	49,565	50,717
	Personal Income (Thousands of \$)	954,342	1,003,920	1,089,793
	Per Capita Pers Income (\$)	19,736	20,255	21,488
	Personal Income Fishing (Thousands of \$)	1,540	1,918	2,068

Duval County (Table 35) shows slow growth in population over the three years listed, but does show growth in personal income from fishing from 1993 to 1994. There was a slight decrease in personal income from fishing reported from 1994 to 1995.

Table 35. Population and Economic Information for Duval County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Duval				
	Population	701,267	703,152	705,014
	Personal Income (Thousands of \$)	14,111,822	14,724,897	15,748,121
	Per Capita Pers Income (\$)	20,123	20,941	22,337
	Personal Income Fishing (Thousands of \$)	2,272	3,658	3,335

St John's County (Table 36) had some growth in personal income from fishing from 1993 to 1994 but no data were available for 1995 to indicate whether that trend continued.

Table 36. Population and Economic Information for St. John's County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
St. Johns				
	Population	94,480	98,377	101,966
	Personal Income (Thousands of \$)	2,394,764	2,612,557	2,869,300
	Per Capita Pers Income (\$)	25,347	26,557	28,140
	Personal Income Fishing (Thousands of \$)	432	502	----

According to Table 37, Flagler County had no individuals reporting personal income from fishing for the time period 1993 to 1995. Volusia County also has no personal income from fishing listed in Table 38, but data were not included due to confidentiality issues.

Table 37. Population and Economic Information for Flagler County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Flagler				
	Population	35,868	37,894	40,260
	Personal Income (Thousands of \$)	571,528	631,959	692,269
	Per Capita Pers Income (\$)	15,934	16,677	17,195
	Personal Income Fishing (Thousands of \$)	0	0	0

Table 38. Population and Economic Information for Volusia County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Volusia				
	Population	397,372	405,515	410,115
	Personal Income (Thousands of \$)	6,845,402	7,235,060	7,772,063
	Per Capita Pers Income (\$)	17,227	17,842	18,951
	Personal Income Fishing (Thousands of \$)	----	----	----

Indian River County saw an increase in personal income from fishing from 1993 to 1994 according to Table 39, but saw a decrease from 1994 to 1995. St. Lucie County (Table 40) may have had a similar trend although data from 1993 are missing and the trend is not clear.

Table 39. Population and Economic Information for Indian River County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Indian River				
	Population	94,184	95,374	96,263
	Personal Income (Thousands of \$)	2,686,514	2,827,427	3,065,533
	Per Capita Pers Income (\$)	28,524	29,646	31,845
	Personal Income Fishing (Thousands of \$)	1,340	1,826	1,707

Table 40. Population and Economic Information for St. Lucie County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
St. Lucie				
	Population	165,120	169,284	171,914
	Personal Income (Thousands of \$)	2,719,602	2,840,752	3,051,018
	Per Capita Pers Income (\$)	16,470	16,781	17,747
	Personal Income Fishing (Thousands of \$)	- - - -	1,855	1,303

Table 41. Population and Economic Information for Broward County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Broward				
	Population	1,353,279	1,358,585	1,412,942
	Personal Income (Thousands of \$)	32,716,045	34,273,950	37,007,667
	Per Capita Pers Income (\$)	24,175	24,736	26,192
	Personal Income Fishing (Thousands of \$)	658	816	- - - -

The trend in personal income from fishing for Broward County is not clear as data from 1995 are missing from Table 41 because of confidentiality. Brevard County (Table 42) shows a decrease in personal income from fishing during 1994 to 1995, but overall shows a much larger percentage of personal income coming from fishing than most counties previous.

Table 42. Population and Economic Information for Brevard County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Brevard				
	Population	435,546	443,337	450,238
	Personal Income (Thousands of \$)	8,564,204	8,938,218	9,341,030
	Per Capita Pers Income (\$)	19,663	20,161	20,747
	Personal Income Fishing (Thousands of \$)	3,600	4,690	3,797

Martin County has one of the highest per capita incomes reported over the three year period according to Table 43. There was also a significant increase in personal income from fishing from 1993 to 1994 which decreased in 1995. Palm Beach County, with an even higher per capita income, showed an increase in personal income from fishing from 1993 to 1994 with no data available for 1995 (Table 44).

Table 43. Population and Economic Information for Martin County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Martin				
	Population	107,238	109,194	110,495
	Personal Income (Thousands of \$)	3,406,064	3,521,665	3,815,294
	Per Capita Pers Income (\$)	31,762	32,251	34,529
	Personal Income Fishing (Thousands of \$)	270	1,658	819

Table 44. Population and Economic Information for Palm Beach County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Palm Beach				
	Population	933,644	957,522	976,358
	Personal Income (Thousands of \$)	30,994,531	32,423,719	35,204,121
	Per Capita Pers Income (\$)	33,197	33,862	36,057
	Personal Income Fishing (Thousands of \$)	1,464	1,902	----

Dade County shows a steady growth in personal income from fishing for the time period listed in Table 45. Monroe County shows, by far, the highest personal income from fishing for any Florida county and most likely any county in the South Atlantic according to Table 46.

Table 45. Population and Economic Information for Dade County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Dade				
	Population	1,985,373	2,011,571	2,046,078
	Personal Income (Thousands of \$)	39,110,301	40,344,476	43,087,320
	Per Capita Pers Income (\$)	19,699	20,056	21,058
	Personal Income Fishing (Thousands of \$)	1,247	1,479	1,897

Table 46. Population and Economic Information for Monroe County, Florida. Source: Bureau of Economic Analysis, U.S. Dept. of Commerce.

County		1993	1994	1995
Monroe				
	Population	81,737	81,461	81,152
	Personal Income (Thousands of \$)	1,982,209	2,054,326	2,208,152
	Per Capita Pers Income (\$)	24,251	25,219	27,210
	Personal Income Fishing (Thousands of \$)	13,506	15,558	16,723

Recently, data were compiled from the last three census and placed into a user friendly interface through a MARFIN grant by the Louisiana Population Data Center, Louisiana State University (C. M. Tolbert, et al. 1998). Those data provide a time series of information from the last three census with the ability to compare several variables at the state, county and place level. Census places are incorporated and Census designated places of 2500 or more persons. The tables presented below incorporate the data included in the MARFIN SocioDemographic Database for the coastal counties outlined above with a focus on the occupational classification of Farm/Fish/Forest and the industry classification of Agriculture, Fishing, and Mining. These classifications are inclusive of those within the occupation and industry of fishing, but not exclusive of others, therefore it is difficult to know the exact number of individuals who have indicated their occupation or business is fishing. We can only assume that whatever trend appears over the time corresponds to the occupation of fishing as well as the others.

Data covering Metropolitan Statistical Areas are provided because it includes a more detailed occupational breakdown, but unfortunately geographic boundaries expand as most MSAs encompass more than one county. In some cases, MSAs were not used because the area covered did not correspond with the coastal areas within the South Atlantic region. As mentioned earlier, these data are what is currently available. Further analysis is constrained by variety of issues relating to data computability and availability at each place level of analysis. As mentioned before more research on

fishing communities will be required before a more complete definition and identification can be accomplished.

Examining census data at the level of Metropolitan Statistical area reveals greater detail for occupation, but the scale changes as MSAs often times encompass more than one county. Metropolitan area (MA) is a large population nucleus, together with adjacent communities that have a high degree of economic and social integration with that nucleus. Metropolitan Areas must contain either a place with a minimum population of 50,000 or a Census Bureau-defined urbanized area and a total MA population of at least 100,000. An MA comprises one or more central counties and also may include one or more outlying counties that have close economic and social relationships with the central county. Metropolitan statistical areas (MSA's) are relatively freestanding MA's and are not closely associated with other MA's. These areas typically are surrounded by nonmetropolitan counties. See Appendix ?? for details on the parameters for the coastal MSAs included in this discussion.

When you look at the occupations of farming, fishing and forestry for Florida coastal counties in Table 47, over the past 20 years there is, in general, a steady increase in the number of individuals within these occupations and industries.

Table 47. Number within Farm/Fish/Forest Occupation and Agriculture, Fishing, Mining Industry for East Florida Coastal Counties from 1970, 1980, and 1990 Census. Source: MARFIN Sociodemographic Database

County	Occupation/Industry	1970	1980	1990
Nassau County	Farm/Fish/Forest	371	427	559
	Agri.,Fishing,Mining	501	462	606
Duval County	Farm/Fish/Forest	1237	2782	3729
	Agri.,Fishing,Mining	2536	2959	4324
St.Johns County	Farm/Fish/Forest	794	813	1002
	Agri.,Fishing,Mining	1012	883	976
Flagler County	Farm/Fish/Forest	145	314	408
	Agri.,Fishing,Mining	186	298	403
Volusia County	Farm/Fish/Forest	1308	3150	4917
	Agri.,Fishing,Mining	2511	3407	5606
Indian River County	Farm/Fish/Forest	991	1907	2042
	Agri.,Fishing,Mining	1454	2361	2217
St. Lucie County	Farm/Fish/Forest	2602	2710	3147
	Agri.,Fishing,Mining	3253	3252	3342
Broward County	Farm/Fish/Forest	1982	7358	9425
	Agri.,Fishing,Mining	5354	7756	10317
Brevard County	Farm/Fish/Forest	764	1772	3369
	Agri.,Fishing,Mining	1394	2279	3585
Martin County	Farm/Fish/Forest	964	1838	1983
	Agri.,Fishing,Mining	1268	2032	2086
Palm Beach County	Farm/Fish/Forest	6552	9676	13261
	Agri.,Fishing,Mining	9791	11780	15155
Dade County	Farm/Fish/Forest	4804	11257	14894
	Agri.,Fishing,Mining	9682	13708	16926
Monroe County	Farm/Fish/Forest	163	1769	1729
	Agri.,Fishing,Mining	920	1932	1860

The following table includes only those individuals who reported their occupation as fishing for the following Metropolitan Statistical Areas (MSA) within Florida.

Table 48. Number of Individuals in Occupation of Fishing By Work Status and Gender for Florida MSA in 1989. Source: 1990 Census Of Population And Housing.

Jacksonville		Year Round Full Time	Other	Total
	Male	151	210	361
	Female	15	49	64
	Total	166	259	425
West Palm Beach		Year Round Full Time	Other	Total
	Male	94	47	141
	Female	0	0	0
	Total	94	47	141
Miami		Year Round Full Time	Other	Total
	Male	254	254	508
	Female	0	30	0
	Total	254	284	538

Snapper Grouper Fishery Profile

Concentrations of reef fishermen can be found in the communities of Mayport, Port Orange and New Smyrna, north of Cape Canaveral. Bandit reels are the primary gear used for reef fishing in these areas, although a few bottom longline vessels are present. In northern Florida, bandit fishermen report trips lasting 5-6 days and fish 30-50 miles offshore. They average between 2 to 3 crew members depending on vessel size and gear. Vessels from the Mayport area reported fishing from the Georgia line south to the Daytona area. The larger longline vessels are required by regulations to fish past the 50 fathom line and reported trip lengths of up to 10 days, fishing as far as 100 miles from shore. These bottom long line vessels fish for deep water species such as tilefish in water 600 - 900' deep (Iverson, 1997).

King Mackerel Fishery Profile

McKenna (1994) identified the number of fishermen in Florida reporting landings of king mackerel (based on Saltwater Products Licenses) from 1987 to 1993 as varying from 1,500 to 2,222. From 1986 to 1990 the number of commercial permits for Atlantic migratory group king mackerel ranged from a high of 888 in 1989/90 fishing season to low of 785 in the 1987/88 fishing year. The percentage of those permits which were hook and line fishermen for those years ranged from 89% in 86/87 to 78% in 1990. There were 1654 vessels permitted for commercial king mackerel and Spanish mackerel in Florida for the 1993-94 fishing year. The number of permitted vessels was divided with 846 and 808 allocated to the East and West coasts respectively. How many of those vessels landed king mackerel is unknown at this time. Catch per unit of effort data seems fairly consistent for the southeastern region of the Atlantic group king mackerel with an average CPUE of between 200-300 lbs/trip (McKenna, 1994). Most of the commercial landings of Atlantic group king mackerel are made by hook and line fishermen. In addition, because most landings of Atlantic group king mackerel are in Florida and the most information that exists is on the Florida fishery, the following description will focus primarily on the Florida fishery unless noted otherwise.

King Mackerel Hook and Line Fleet

There were approximately 203 full and part time vessels in the hook and line mackerel fleet in 1980. Vessel size ranged from 22-44 feet in length. Today, the Florida South Atlantic troll fishery is composed of about 100 full-time and 100 part-time operations, about 150 of them are dependent upon king mackerel. Full-time fishermen operate primarily out of Jupiter, Port Salerno, Fort Pierce, Sebastian, and Rivera Beach. Normally, there is one fisherman to a boat. Part-time fishermen operate mostly out of Palm Beach, frequently two or three fishermen per boat. Approximately 40 percent of the full time trollers switch to bottom fishing for various reef fish after the Gulf king mackerel season. The remainder of these full time trollers tie up their boats when the Gulf king mackerel season ends. Some engage in various non-fishing jobs, while the majority reportedly wait for the opening of the Atlantic king mackerel season (GMFMC & SAFMC, 1994).

During the peak season about 75 to 100 troll vessels and 16 to 20 net vessels target king mackerel in the Keys. Net vessels usually start fishing late December, although some of these vessels troll for mackerel before net fishing becomes more practicable. Most king mackerel fishermen in the Keys target other species such as stone crab, spiny lobster, and reef fish throughout the year.

King Mackerel Net Fishing Fleet

There were approximately 89 large gill net vessels in Florida including full and part time in 1980. The vessels ranged in size from 30-65 feet. These vessels fished Spanish and king mackerel during the winter, but also targeted lobster, swordfish and bait fish during other times of the year. Vessels over 40 feet usually employed a power roller to haul nets. The large gill net fleet was primarily located from Florida's central east coast in Ft. Pierce, throughout the Florida Keys to the central west coast as far north as Cortez. There were also a few large boats in the Panhandle area of Port St. Joseph (Centaur Associates, 1981).

Approximately 87% of captains in the large gill net fleet at that time depended entirely upon fishing for their income. Net fishermen, then as they do today, have the options of participating in the Spanish mackerel fishery, trolling for king mackerel, and fishing with nets or hook and line for Atlantic group king mackerel after March (Centaur Associates 1981).

Today, there are twelve large net boats located in the Keys that may fish Atlantic group king mackerel occasionally. These vessels have a capacity of up to 40,000 pounds per trip and have had large catches of king mackerel in the past. There does not seem to be a small gill net boat sector for Atlantic king mackerel. In Monroe County there are 16 to 20 large net boats currently participating in the king mackerel fishery, some with capacity to land up to 50,000 pounds. There are another 6 to 12 small net boats in south-west Florida ready to enter the fishery when the opportunity arises. These vessels are 30 to 40 feet in length with capacities of 5,000 to 10,000 pounds.

There has been a general decline in net catches along the Florida east coast. This may be attributed to regulations like the prohibition of drift nets and purse seines, but also stems from the recent net ban in Florida state waters.

King Mackerel Dealers

McKenna (1994) identified over 200 dealers in Florida who had handled king mackerel since 1987. In 1992 there were 240 who reported landings of king mackerel. Most of those dealers purchased king mackerel ten or fewer times per season and handled less than 5000 pounds. There were over twenty dealers who handled 100,000 pounds or more during the 1992 season (McKenna, 1994).

Possible fishing communities in Florida: Mayport, Port Orange, New Smyrna, Sebastian, Port Salerno, Rivera Beach, Ft. Pierce, Jupiter, West Palm Beach, Boyton Beaches, The Keys -- Upper Keys: Key Largo, Tavernier; Middle Keys - Islamorada, Marathon; Lower Keys; and Key West.

4.3.3.1.6 Other Community related Analysis

In a recent survey of snapper grouper fishermen in the South Atlantic questions were posed concerning a fishermen's tenure within a community and attitudes towards community change. The results in Table 49 show that the majority of fishermen feel their community has stayed the same or has changed for the better. A larger percentage of inactive than active snapper grouper fishermen feel that their community has changed for the worse. Well over half of fishermen interviewed had been in their present community for twenty years or more. Over sixty percent of inactive fishermen have lived in their community for twenty years or more, while over fifty percent of active fishermen have lived in their communities for 19 years or less. The mean number of years a fishermen had resided in their present community was twenty years or more for North Carolina, South Carolina and Florida. In comparison Georgia snapper grouper fishermen had an average tenure in their communities of 6.5 years. This may be an artifact of the small sample size in Georgia as only seven fishermen from that state were interviewed, but could also be reflective of the nature of snapper grouper fishing in Georgia (Rhodes et al., 1997).

Table 49. Snapper Grouper Fishermen's Tenure and Attitude toward Change in their Present Community. Source: Socio-demographic Assessment of Commercial Reef Fishermen in the South Atlantic Region. 1997.

	Active (%)	Inactive (%)
Feel Your Community has changed?	(N=201)	(N=26)
For the better	41.8	30.8
For the worse	32.1	46.2
Stayed the same	25.9	23.1
	Active (Yrs)	Inactive (Yrs)
Number of Years in Present Community?	(N=201)	(N=26)
2-12	27.6	25.9
13-19	32.0	11.1
20-35	19.5	33.4
36 <	20.9	29.6

These perspectives on an individual's feelings toward a community become important when that person must face significant changes regarding his/her occupation, as is often the case when limited entry or some other form of fisheries management is implemented. An individual's commitment toward their community and sense of belonging will influence decisions on whether to stay in fishing or within a particular community. The impacts become important for the community if many individuals face the same decision. When active fishermen were asked what is the

likelihood of moving to a new town in the next 2-3 years most responded that it is was unlikely, however, over 27% indicated they were not sure or it was likely. When both inactive and active fishermen were asked the likelihood of leaving commercial fishing altogether 46% of inactive fishermen said it was likely or very likely, while only 11% of active fishermen indicated such a likelihood. (Rhodes et al., 1997). These type of data at the community level would contribute much to the understanding of possible impacts of future fisheries management.

4.3.3.1.7 Data Needs

As mentioned earlier, the data presented here is what is currently available and readily accessible. It is very limiting and does not provide a sufficient amount of detail needed to define and identify fishing communities. Therefore, the likelihood of realistic impact assessment of future fishing regulations on fishing communities is not good.

At the present the NMFS does not collect data on fishing communities. Therefore, it is impossible to realistically identify fishing communities in this amendment. There is a tremendous need for research to be conducted on a continuous basis to collect this information. Both state and federal government agencies have access to current information which can inform the process of identifying fishing communities. Permit databases for fishing licenses, wholesale and retail licenses, boat registrations, marina permits, boat landing locations, and many others exist now. Putting that information into one database is a monumental task, but should be undertaken soon. Geographic Information System software is now available and being used to compile much of the data regarding habitat. The same type of databases need to be created regarding fishing communities. Spatial analysis of the variables that help identify and define fishing communities can give useful insight into the changes that affect these coastal communities.

It is unlikely that Council Staff would be able to gather these data. Council staff have in the past, with the cooperation of industry, been able to gather important information about a particular fishery, but were criticized for not following OMB guidelines. The difficulty with following OMB guidelines is that approval of data gathering tools is too time consuming. Councils are often on a timeline to develop FMPs which does not allow for a lengthy approval process. The South Atlantic Council staff has sufficient expertise with this type of data collection that design, implementation and analysis can often take place during an extremely short time period with little burden upon the public. In fact, industry is often eager to provide these type of data for consideration during development of an FMP, but don't have the expertise to offer data a form that can be used by Council staff.

Data collection is critical to the future of impact assessment of fishing communities. Standards must be set and data need to be collected. At present, the ACCSP is attempting to set those standards and has included social and economic data in that program. The ACCSP Technical Source Document IV contains detailed social and economic data needs and draft survey instruments. Social and economic data collection projects should at least collect the minimum data elements. Support of ACCSP can be an important step in meeting the future needs of the councils with regard to fishing communities. In addition, another guideline for the types of data needed can be found in the Southeast Social and Cultural Data Analysis Plan (NMFS, 1994). The plan was designed to address many of the current social and cultural information needs for the three councils in the Southeast. ”

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Appendix H. Trends in Dolphin and Wahoo Commercial and Recreational Catch Rates:
A Study for The South Atlantic Fishery Management Council (Source: Goodyear, 1999).

Trends in Dolphin and Wahoo Commercial and Recreational Catch Rates:
A Study for The South Atlantic Fishery Management Council

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March 2, 1999

Data Sources Available for the Analyses

Data Source	Requested	Have	Imported	Extracted	Processed
Recreational					
MRFSS catch	X	X	X	X	X
MRFSS size	X	X	X	X	X
MRFSS cpue	X	X	X	X	X
TPWD catch	X	X	X	X	X
TPWD length	X	X	X	X	X
TPWD trips	X	X	X	X	X
TPWD fish	X	X	X	X	X
TPWD party	X	X	X	X	X
Headboat catch	X	X	X	X	X
Headboat bioprofile	X	X	X	X	X
Headboat effort	X	X	X	X	X
Headboat vessel	X	X	X	X	X
Large Pelagic catch	X	X	X	X	X
Large Pelagic size	X	X	X	X	X
Large Pelagic cpue	X	X	X	X	X
NMFS Charterboat Master	X	X	X	X	X
NMFS Charterboat Vessels	X	X	X	X	X
SC Charterboat survey	X	X	X	X	X
AL Charterboat size	X	X	X	X	X
NC Survey	X (Data incorporated into MRFSS intercept files)				
Commercial					
NMFS Commercial Catches	X	X	X	X	X
FL Commercial Catches	X	X	X	X	X
GOM Reef fish logbook	X	X	X	X	X
SA Reef fish logbook	X	X	X	X	X
Pelagic longline logbook	X	X	X	X	X
Pelagic longline weigh out	X	X	X	X	X
Pelagic longline observers	X	X	X	X	X
Trip Interview Program	X	X	X	X	X

Dolphin Recreational Landings

Dolphin Annual Totals

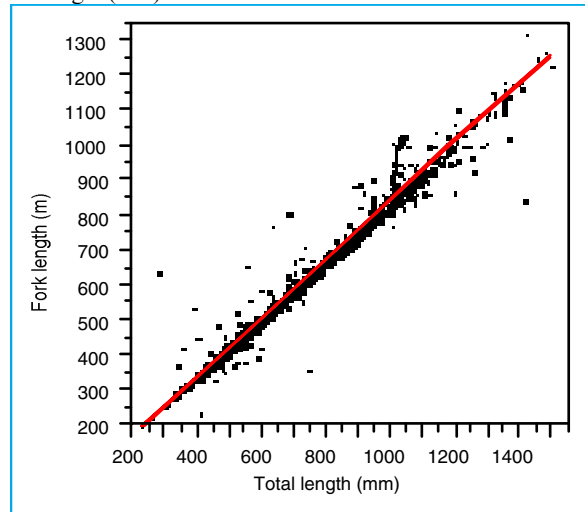
YR	Headboat		Charter		Private/Rental		Total	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
81	23,056	76,103	228,038	1,606,560	408,715	2,969,018	659,809	4,651,681
82	39,977	95,021	467,180	2,528,861	816,955	4,456,811	1,324,112	7,080,691
83	13,714	53,692	146,907	847,827	1,009,223	6,072,043	1,169,844	6,973,563
84	18,896	55,842	135,424	861,529	833,706	3,576,840	988,025	4,494,210
85	5,348	33,686	149,895	927,970	1,008,560	6,038,049	1,163,803	6,999,705
86	18,396	70,347	424,240	3,195,089	1,014,289	6,620,998	1,495,387	10,088,250
87	17,797	63,876	537,243	3,008,939	917,785	4,205,998	1,472,825	7,278,815
88	12,191	45,540	448,513	1,672,217	1,054,986	5,932,472	1,522,362	7,670,456
89	19,369	63,501	769,175	3,925,113	1,899,695	9,586,182	2,693,550	13,592,950
90	30,387	141,218	378,658	2,202,994	1,099,335	7,767,084	1,761,093	12,904,230
91	18,508	93,120	673,100	4,466,616	1,966,721	12,801,070	2,658,329	17,360,800
92	8,601	45,619	475,690	4,062,992	834,232	5,814,886	1,330,661	9,976,774
93	14,234	63,656	1,142,284	6,493,442	831,451	4,825,101	2,019,027	11,460,040
94	10,897	39,113	1,158,643	6,310,622	1,036,197	6,428,897	2,206,731	12,787,150
95	12,720	70,943	1,254,486	10,873,300	1,003,538	8,974,380	2,272,314	19,920,700
96	14,668	54,172	800,878	6,699,763	891,306	6,069,741	1,706,852	12,823,680
97	11,639	48,348	1,273,035	13,765,780	931,847	8,743,603	2,216,521	22,557,710

Dolphin Recreational Size Limits

Dolphin All Areas

Size Mm FL	Headboat				Party/Charter				Private/Rental				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %
< 300	1.5	1.5	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
301-350	2.1	3.6	0.4	0.5	0.1	0.1	0.0	0.0	0.4	0.5	0.0	0.1	0.1	0.1	0.0	0.0
351-400	8.2	11.8	2.1	2.6	0.9	0.9	0.2	0.2	3.3	3.8	0.5	0.6	1.3	1.5	0.2	0.2
401-450	12.0	23.8	4.2	6.9	2.5	3.5	0.6	0.8	6.1	9.9	1.3	1.8	3.2	4.6	0.7	1.0
451-500	14.6	38.4	7.0	13.9	10.8	14.3	3.5	4.3	9.0	18.9	2.5	4.4	10.5	15.1	3.3	4.3
501-550	17.3	55.7	10.7	24.6	21.8	36.1	9.1	13.4	11.4	30.3	4.2	8.6	20.0	35.1	8.2	12.5
551-600	11.5	67.2	9.1	33.7	14.1	50.2	7.5	20.9	10.8	41.1	5.1	13.8	13.5	48.6	7.0	19.5
601-650	6.1	73.3	6.1	39.8	9.2	59.5	6.1	27.0	9.9	50.9	5.9	19.6	9.3	58.0	6.0	25.6
651-700	4.8	78.0	5.9	45.8	5.7	65.1	4.7	31.7	7.0	57.9	5.1	24.7	5.9	63.9	4.8	30.3
701-750	4.9	83.0	7.4	53.2	3.8	68.9	3.8	35.4	6.5	64.4	5.8	30.6	4.2	68.1	4.2	34.5
751-800	2.7	85.7	4.8	58.0	4.6	73.4	5.6	41.0	3.9	68.3	4.1	34.7	4.4	72.5	5.3	39.8
801-850	4.4	90.1	9.4	67.4	4.6	78.0	6.6	47.6	4.6	72.9	5.7	40.4	4.6	77.1	6.4	46.2
851-900	2.5	92.6	6.3	73.7	5.3	83.3	8.9	56.5	5.5	78.3	8.2	48.6	5.3	82.5	8.7	55.0
901-1000	4.0	96.6	12.1	85.7	8.9	92.2	18.4	74.9	12.8	91.1	24.7	73.3	9.6	92.0	19.6	74.6

Dolphin Fork Length (mm) By Total length (mm)



☐ Fitting ☒ Linear Fit

Linear Fit

$$\text{Fork length (m)} = 1.59779 + 0.83677 \text{ Total length (mm)}$$

Summary of Fit

RSquare	0.980438
RSquare Adj	0.980431
Root Mean Square Error	24.51826
Mean of Response	541.8344
Observations (or Sum Wgts)	2899

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	87284973	87284973	145197.8
Error	2897	1741518	601.1452	Prob>F
C Total	2898	89026491		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	1.5977865	1.4891	1.07	0.2834
Total length (mm)	0.8367711	0.002196	381.05	0.0000

Nonlinear Fitting Control Panel

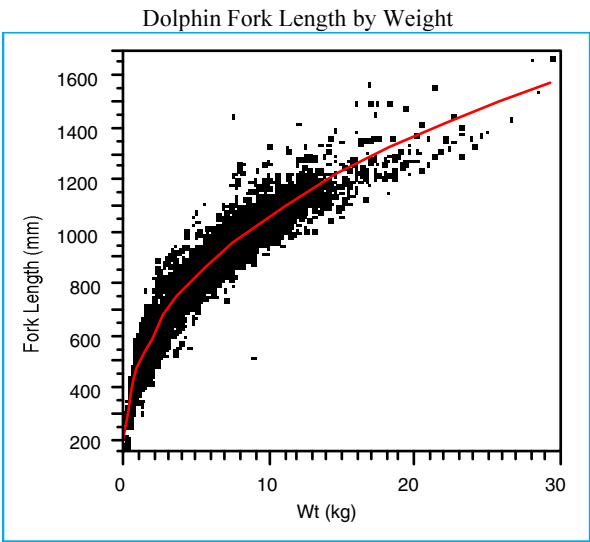
_ Second Deriv. Method
 _ Continuous Update
 _ Iteration Log
 _ Loss is -LogLikelihood
 PLCI iter=1 Converged g=0.00469
 Converged in the Gradient

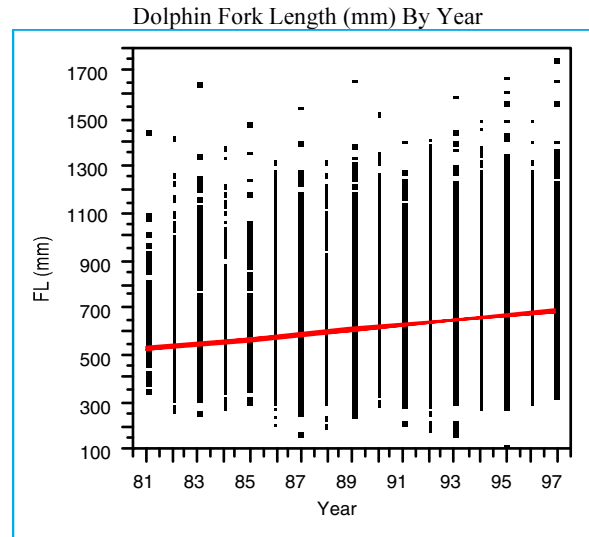
	Current	Limit	Alpha
Iteration	1	60	0.050
Shortening	0	15	
O Criterion	2.458692e-12	0.0000001	
D Criterion	8.934562e-11	0.0000001	
G Criterion	2.576568e-16	0.000001	
CL Criterion	?	0.00001	

Parameter	Current Value	Lock	SSE
p1	470.40733804	—	48728678.461
p2	0.3563859561	—	48733983.89

	Solution			
	SSE	DFE	MSE	RMSE
	48728678.461	35285	1381.0026	37.161844

Parameter	Estimate	ApproxStdErr	Lower CL	Upper CL
p1	470.40733804	0.24986684	469.917591	470.897085
p2	0.3563859561	0.00036833	0.35566401	0.3571079





Linear Fit

$$FL \text{ (mm)} = -284.82 + 10.0443 \text{ Year}$$

Summary of Fit

RSquare	0.036284
RSquare Adj	0.036258
Root Mean Square Error	187.8641
Mean of Response	643.1458
Observations (or Sum Wgts)	37645

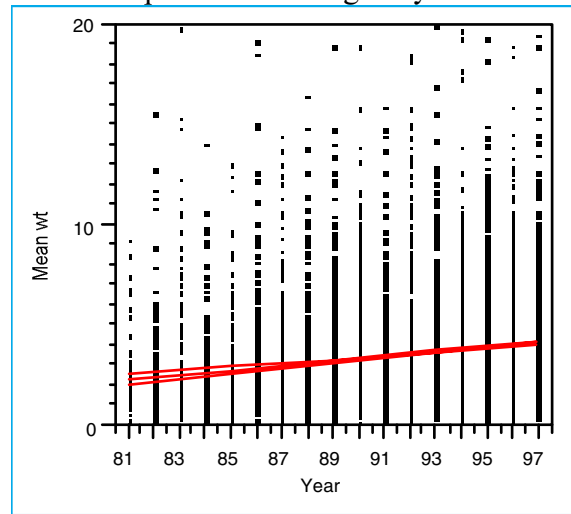
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	50019232.3	50019232	1417.259
Error	37643	1328531947	35292.93	Prob>F
C Total	37644	1378551180		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-284.8169	24.66839	-11.55	<.0001
Year	10.044267	0.266805	37.65	<.0001

Dolphin Mean Weight By Year



▶ Fitting ▶ Linear Fit

Linear Fit

$$\text{Mean wt} = -6.9656 + 0.1152 \text{ Year}$$

Summary of Fit

RSquare	0.025844
RSquare Adj	0.025715
Root Mean Square Error	2.82595
Mean of Response	3.584954
Observations (or Sum Wgts)	7591

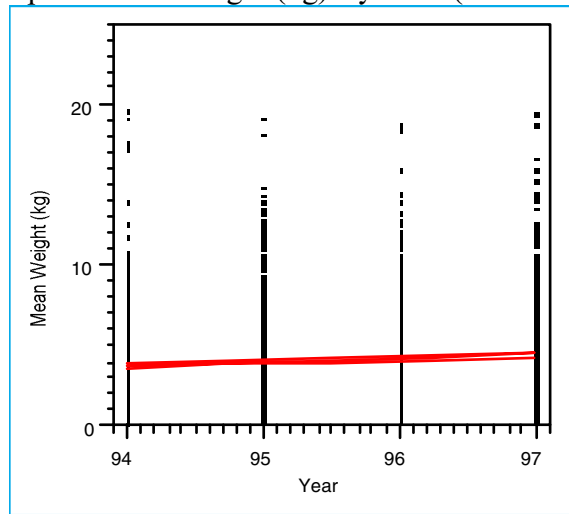
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1607.835	1607.84	201.3319
Error	7589	60605.714	7.99	Prob>F
C Total	7590	62213.550		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-6.965575	0.74427	-9.36	<.0001
Year	0.1151981	0.008119	14.19	<.0001

Dolphin Mean Weight (kg) By Year (1994-1997)



☐ Fitting
 ☒ Linear Fit

Linear Fit

$$\text{Mean Weight (kg)} = -18.338 + 0.2355 \text{ Year}$$

Summary of Fit

RSquare	0.008351
RSquare Adj	0.00803
Root Mean Square Error	2.913549
Mean of Response	4.137488
Observations (or Sum Wgts)	3093

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	220.954	220.954	26.0290
Error	3091	26238.783	8.489	Prob>F
C Total	3092	26459.736		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-18.33767	4.4056	-4.16	<.0001
Year	0.2355042	0.04616	5.10	<.0001

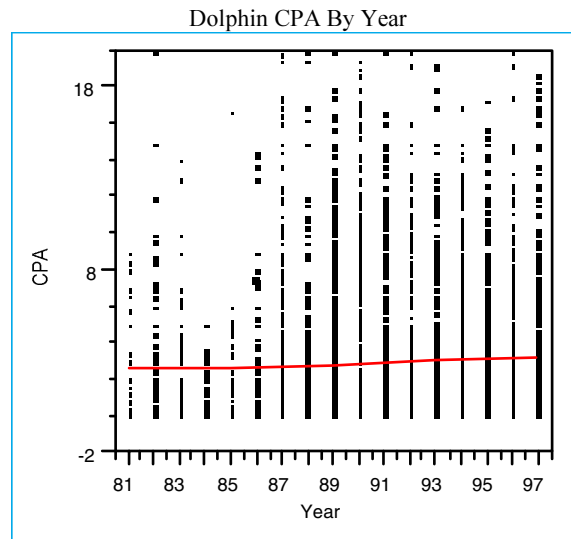
Dolphin Recreational Bag and Trip Limits

Dolphin Bag Limit All Areas

Bag Limit	Headboat				Party/Charter				Private/Rental				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	Int %		% Red		Int %		% Red		Int %		% Red		Int %		% Red	
	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
1	59.8	40.2	69.1	30.9	21.2	78.8	25.0	75.0	43.7	56.3	49.6	50.4	26.8	73.2	32.2	67.8
2	13.2	27.0	11.4	19.6	14.7	64.0	15.6	59.4	20.1	36.2	20.5	29.9	15.7	57.5	16.3	51.4
3	7.7	19.3	6.2	13.4	11.8	52.2	11.9	47.5	10.6	25.5	10.0	19.8	11.5	46.0	11.2	40.2
4	5.2	14.1	3.9	9.5	9.9	42.3	9.6	37.9	6.2	19.3	5.5	14.3	9.0	37.0	8.5	31.7
5	3.6	10.5	2.6	6.9	8.5	33.8	8.1	29.8	4.2	15.2	3.5	10.7	7.5	29.5	6.9	24.8
6	2.6	7.9	1.8	5.0	7.2	26.6	6.7	23.1	2.9	12.3	2.4	8.4	6.2	23.2	5.6	19.2
7	1.9	6.0	1.3	3.7	6.2	20.4	5.7	17.4	2.2	10.1	1.7	6.6	5.3	17.9	4.7	14.6
8	1.4	4.6	1.0	2.7	5.2	15.2	4.7	12.7	1.7	8.4	1.3	5.3	4.4	13.5	3.8	10.7
9	1.0	3.6	0.6	2.1	4.3	10.9	3.8	8.9	1.4	7.0	1.0	4.3	3.6	9.9	3.1	7.7
10	0.7	2.8	0.5	1.6	3.5	7.4	3.1	5.8	1.2	5.9	0.9	3.4	3.0	6.9	2.5	5.1
11	0.5	2.3	0.3	1.3	1.7	5.6	1.5	4.4	0.6	5.3	0.4	3.0	1.5	5.4	1.2	3.9
12	0.5	1.8	0.3	1.0	1.4	4.2	1.2	3.2	0.6	4.7	0.4	2.6	1.2	4.2	1.0	2.9
13	0.4	1.4	0.2	0.8	0.8	3.3	0.7	2.5	0.5	4.2	0.3	2.3	0.8	3.4	0.6	2.4
14	0.3	1.2	0.2	0.6	0.7	2.6	0.6	1.9	0.4	3.8	0.3	2.0	0.6	2.8	0.5	1.9
15	0.2	1.0	0.1	0.5	0.6	2.1	0.5	1.5	0.3	3.5	0.2	1.8	0.5	2.3	0.4	1.5
20	0.5	0.5	0.3	0.2	1.2	0.9	0.9	0.6	1.2	2.2	0.8	1.0	1.2	1.1	0.8	0.6
25	0.2	0.3	0.1	0.1	0.4	0.4	0.3	0.3	0.5	1.7	0.3	0.7	0.4	0.7	0.3	0.4

Dolphin Trip Limit All Areas

Trip Limit	Headboat				Party/Charter				Private/Rental				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
5	36.1	63.9	45.2	54.8	21.6	78.4	25.0	75.0	65.3	34.7	71.4	28.6	30.1	69.9	36.0	64.0
10	12.9	51.0	13.4	41.4	14.3	64.1	14.9	60.1	13.8	20.9	12.4	16.2	14.2	55.7	14.3	49.7
20	13.7	37.2	13.0	28.5	21.0	43.1	20.6	39.4	10.7	10.2	8.9	7.4	18.8	36.9	17.7	31.9
30	8.1	29.1	7.1	21.4	15.6	27.4	14.8	24.7	4.4	5.8	3.3	4.0	13.3	23.6	11.9	20.0
40	5.6	23.6	4.6	16.8	11.6	15.9	10.6	14.1	2.4	3.4	1.7	2.3	9.7	13.9	8.4	11.6
50	4.2	19.4	3.3	13.5	8.3	7.5	7.5	6.6	1.4	2.0	1.0	1.3	6.9	7.0	5.9	5.7
60	3.4	16.0	2.6	10.9	5.6	1.9	5.0	1.6	1.0	1.0	0.7	0.6	4.7	2.3	3.9	1.7
70	2.6	13.3	2.0	8.9	0.9	1.1	0.7	0.9	0.3	0.7	0.2	0.4	0.9	1.5	0.7	1.1
80	2.1	11.2	1.5	7.3	0.4	0.6	0.4	0.5	0.2	0.4	0.1	0.3	0.5	1.0	0.4	0.7
90	1.7	9.6	1.2	6.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.7	0.3	0.5
100	1.4	8.2	1.0	5.2	0.2	0.1	0.2	0.1	0.1	0.2	0.0	0.1	0.2	0.5	0.2	0.3



Linear Fit

$$\text{CPA} = -0.1354 + 0.03366 \text{ Year}$$

Summary of Fit

RSquare	0.001128
RSquare Adj	0.000996
Root Mean Square Error	4.002495
Mean of Response	2.947139
Observations (or Sum Wgts)	7591

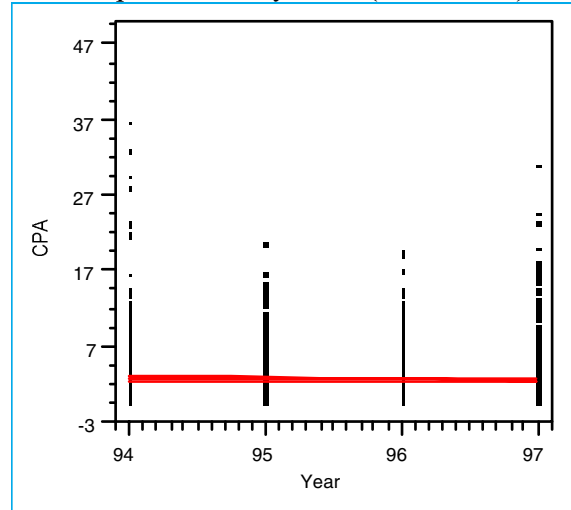
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	137.25	137.254	8.5677
Error	7589	121575.54	16.020	Prob>F
C Total	7590	121712.79		0.0034

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-0.13545	1.054137	-0.13	0.8978
Year	0.0336579	0.011499	2.93	0.0034

Dolphin CPA By Year (1994-1997)



☐ Fitting
 ☒ Linear Fit

Linear Fit

$$\text{CPA} = 11.8375 - 0.09327 \text{ Year}$$

Summary of Fit

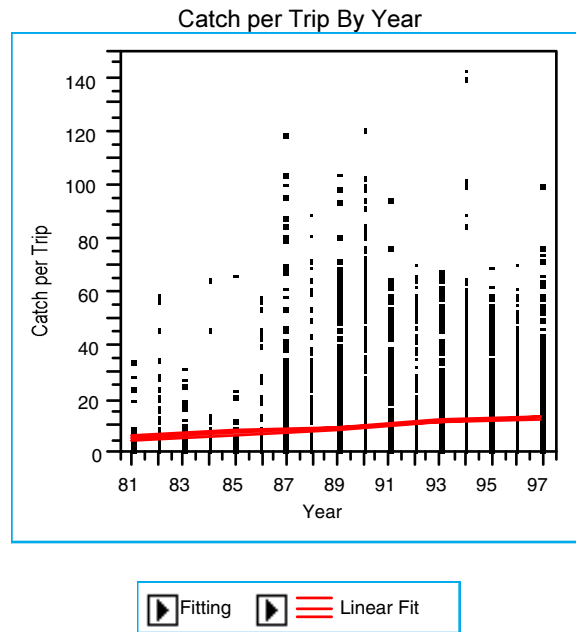
RSquare	0.000705
RSquare Adj	0.000382
Root Mean Square Error	3.985751
Mean of Response	2.935976
Observations (or Sum Wgts)	3093

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	34.659	34.6593	2.1817
Error	3091	49104.275	15.8862	Prob>F
C Total	3092	49138.934		0.1398

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	11.83745	6.026884	1.96	0.0496
Year	-0.093273	0.063148	-1.48	0.1398



Linear Fit

$$\text{Catch per Trip} = -34.32 + 0.49285 \text{ Year}$$

Summary of Fit

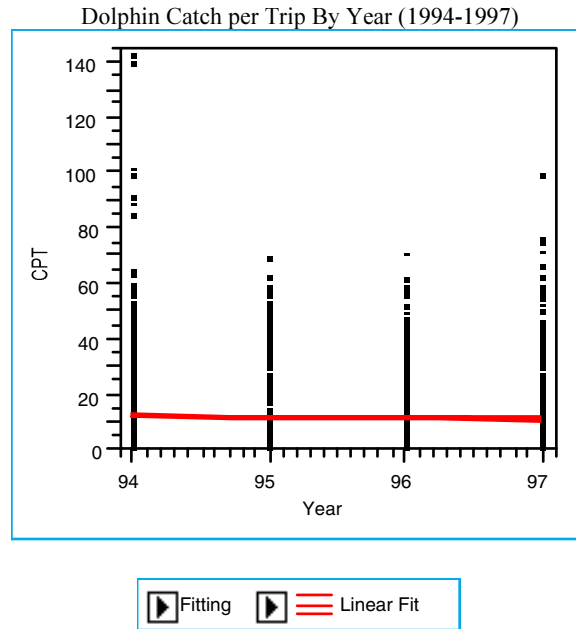
RSquare	0.012755
RSquare Adj	0.012624
Root Mean Square Error	17.3252
Mean of Response	10.81821
Observations (or Sum Wgts)	7591

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	29429.4	29429.4	98.0449
Error	7589	2277933.7	300.2	Prob>F
C Total	7590	2307363.1		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-34.31998	4.562937	-7.52	<.0001
Year	0.4928505	0.049774	9.90	<.0001



Linear Fit

$CPT = 55.591 - 0.45859 \text{ Year}$

Summary of Fit

RSquare	0.000933
RSquare Adj	0.00061
Root Mean Square Error	17.03551
Mean of Response	11.82574
Observations (or Sum Wgts)	3093

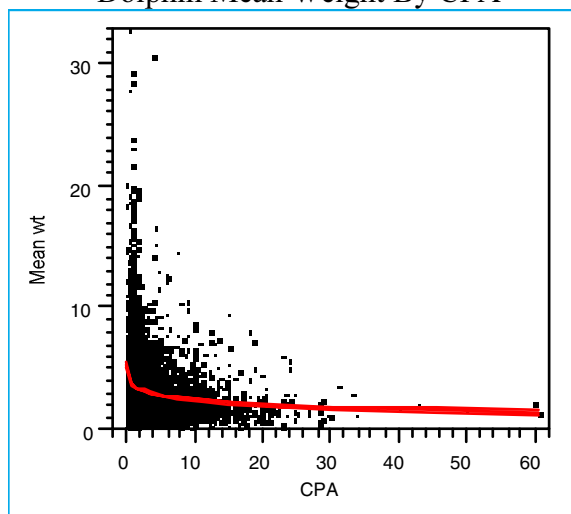
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	837.83	837.829	2.8870
Error	3091	897035.24	290.209	Prob>F
C Total	3092	897873.07		0.0894

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	55.591004	25.75953	2.16	0.0310
Year	-0.458591	0.2699	-1.70	0.0894

Dolphin Mean Weight By CPA



☒ Fitting
 ☒ Transformed Fit to Log

Transformed Fit to Log

Mean wt = 3.86429 - 0.58417 Log(CPA)

Summary of Fit

RSquare	0.048237
RSquare Adj	0.048111
Root Mean Square Error	2.793282
Mean of Response	3.584954
Observations (or Sum Wgts)	7591

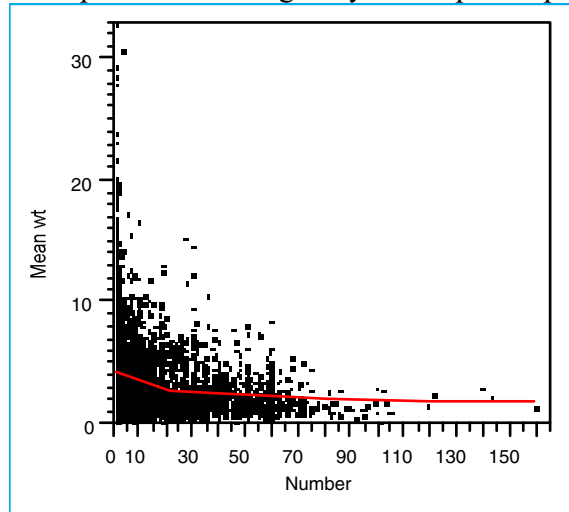
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	3000.971	3000.97	384.6205
Error	7589	59212.578	7.80	Prob>F
C Total	7590	62213.550		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	3.8642881	0.035082	110.15	0.0000
Log(CPA)	-0.58417	0.029787	-19.61	<.0001

Dolphin Mean Weight By Catch per Trip



☒ Fitting
 ☐ Transformed Fit to Log

Transformed Fit to Log
 Mean wt = 4.19247 - 0.45221 Log(Number)

Summary of Fit

RSquare	0.047877
RSquare Adj	0.047751
Root Mean Square Error	2.79381
Mean of Response	3.584954
Observations (or Sum Wgts)	7591

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2978.584	2978.58	381.6069
Error	7589	59234.966	7.81	Prob>F
C Total	7590	62213.550		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	4.1924652	0.04467	93.85	0.0000
Log(Number)	-0.452208	0.023149	-19.53	<.0001

Dolphin Commercial Landings

Dolphin Commercial Totals by Gear (1950-1997)

Gear	N Rows	Pounds	% total
-----	-----	-----	-----
Combined Gears	50	11844787	56.30
Lines Long Set With Hooks	124	3117906	14.82
Lines Troll Other	98	2611375	12.41
Lines Hand Other	152	2104716	10.00
Not Coded	7	1070966	5.09
Rod and Reel	16	97571	0.46
Lines Long Reef Fish	11	61710	0.29
Reel Electric or Hydraulic	7	49047	0.23
Lines Troll Salmon	2	20600	0.10
Trawl Midwater Paired	6	15730	0.07
Troll & Hand Lines Cmb	3	10424	0.05
Otter Trawl Bottom Fish	21	8952	0.04
Lines Troll Tuna	9	4626	0.02
Lines Long Shark	3	4487	0.02
Gill Nets Drift Runaround	3	3600	0.02
Haul Seines Beach	2	3417	0.02
Gill Nets Other	3	1850	0.01
Gill Nets Drift Other	5	1824	0.01
Gill Nets Drift Large Pelagic	5	1084	0.01
Pots And Traps Eel	1	1004	0.00
Gill Nets Sink/Anchor Other	3	592	0.00
Floating Traps (Shallow)	2	500	0.00
Stop Seines	1	400	0.00
Dredge Scallop Sea	2	221	0.00
Harpoons Other	1	152	0.00
Pots And Traps Fish	1	102	0.00
Lines Power Troll Tuna	1	85	0.00
Harpoons Swordfish	2	66	0.00
Pots And Traps Lobster Offshore	1	15	0.00
Pots And Traps Lobster Inshore	1	10	0.00

Dolphin Commercial Totals by State All Years

State	N Rows	Pounds	Percent
-----	-----	-----	-----
Florida West Coast	47	9376129	44.36
Florida East Coast	48	4229386	20.01
Louisiana	14	2862699	13.55
North Carolina	19	1786685	8.45
South Carolina	21	1360478	6.44
New Jersey	15	489272	2.32
New York	17	317928	1.50
Texas	9	300314	1.42
Georgia	16	149593	0.71
Rhode Island	18	90605	0.43
Maryland	16	68537	0.32
Virginia	15	39601	0.19
Massachusetts	11	35908	0.17
Maine	9	10966	0.05
Alabama	5	9439	0.04
Connecticut	6	6648	0.03
Florida	4	3.9	0.00

Dolphin Commercial Totals by State 94-97

State	N Rows	Pounds	Percent
-----	-----	-----	-----
Florida West Coast	4	2911777	38.51
Florida East Coast	4	1445035	19.11
Louisiana	4	919431	12.16
North Carolina	4	873023	11.55
South Carolina	4	822176	10.87
New Jersey	4	277579	3.67
New York	4	128784	1.70
Texas	4	48356	0.64
Georgia	3	44954	0.59
Maryland	4	36561	0.48
Rhode Island	4	21171	0.28
Massachusetts	4	17436	0.23
Maine	4	8202	0.11
Virginia	1	6087	0.08
Connecticut	2	584	0.01
Alabama	1	219	0.00

Dolphin All Areas

Gear	1994	1995	1996	1997
Hook & Line	929,351	1,493,093	988,692	1,104,947
Longline	453,232	1,025,654	507,506	812,059
Other	16,545	24,314	15,284	14,752
Unknown	129,922	284,210	304,326	270,856
Total	1,528,768	2,826,985	1,815,520	2,202,323

Dolphin Commercial Size Limits

Dolphin All Areas

Size Mm FL	Hand Line				Long Line				Other				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %
	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %
< 500	7.3	7.3	0.8	0.8	2.3	2.3	0.2	0.2	-	-	-	-	7.3	7.3	0.8	0.8
501-600	3.0	10.3	0.6	1.4	2.8	5.1	0.5	0.7	-	-	-	-	3.0	10.3	0.6	1.4
601-650	1.3	11.6	0.4	1.7	1.0	6.1	0.2	0.9	-	-	-	-	1.3	11.6	0.4	1.7
651-700	2.5	14.1	0.9	2.6	1.0	7.1	0.3	1.2	-	-	-	-	2.5	14.1	0.9	2.6
701-750	1.7	15.8	0.7	3.3	1.2	8.3	0.4	1.7	-	-	-	-	1.7	15.8	0.7	3.3
751-800	3.3	19.1	1.7	5.0	5.3	13.6	2.3	4.0	-	-	-	-	3.3	19.1	1.7	5.0
801-850	4.2	23.2	2.5	7.5	0.6	14.2	0.3	4.3	-	-	-	-	4.2	23.2	2.5	7.5
851-900	2.7	26.0	1.9	9.5	0.4	14.6	0.2	4.5	-	-	-	-	2.7	26.0	1.9	9.5
901-950	4.4	30.3	3.6	13.1	10.5	25.1	7.6	12.1	-	-	-	-	4.4	30.3	3.6	13.1
951-1000	8.1	38.4	7.7	20.9	6.6	31.7	5.1	17.2	-	-	-	-	8.1	38.4	7.7	20.9
1001-1050	21.3	59.7	23.3	44.2	14.2	45.9	13.0	30.3	-	-	-	-	21.3	59.7	23.3	44.2
1051-1100	19.6	79.3	24.5	68.7	16.6	62.5	17.6	47.8	-	-	-	-	19.6	79.3	24.5	68.7
1101-1150	13.0	92.4	18.2	86.9	6.5	69.0	7.6	55.4	-	-	-	-	13.0	92.3	18.2	86.9
1151-1200	3.5	95.9	5.6	92.5	20.4	89.5	27.7	83.1	-	-	-	-	3.5	95.9	5.6	92.5
1201-1250	3.5	99.4	6.3	98.8	5.2	94.7	7.6	90.7	-	-	-	-	3.5	99.4	6.3	98.8
1251-1300	0.6	100.0	1.2	100.0	5.0	99.7	8.6	99.3	-	-	-	-	0.6	100.0	1.2	100.0
1301-1350	-	100.0	-	100.0	0.2	99.8	0.3	99.6	-	-	-	-	0.0	100.0	0.0	100.0
1351-1400	-	100.0	-	100.0	-	99.8	-	99.6	-	-	-	-	-	100.0	-	100.0
1401-1450	-	100.0	-	100.0	0.1	99.9	0.2	99.8	-	-	-	-	0.0	100.0	0.0	100.0
1451-1500	-	100.0	-	100.0	-	99.9	-	99.8	-	-	-	-	-	100.0	-	100.0

Dolphin Commercial Trip Limits

Dolphin All Areas

Trip Limit	Hand Line/R&R				Long Line				Other				Total			
	Trips		Weight		Trips		Weight		Trips		Weight		Trips		Weight	
	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
100	80.5	19.5	59.5	40.5	49.3	50.7	20.8	79.2	91.6	8.4	37.0	63.0	73.2	26.8	36.9	63.1
200	10.9	8.6	17.7	22.8	14.6	36.1	12.5	66.7	1.3	7.0	11.8	51.2	11.8	15.0	14.7	48.4
300	4.6	4.0	8.0	14.9	6.8	29.3	9.6	57.1	3.5	3.6	5.9	45.3	5.1	9.9	8.9	39.5
400	1.5	2.5	4.4	10.5	5.5	23.8	7.8	49.3	-	3.6	5.2	40.0	2.4	7.5	6.4	33.1
500	0.8	1.7	2.9	7.6	5.0	18.8	6.3	43.1	0.3	3.3	5.0	35.0	1.8	5.7	4.8	28.3
600	0.5	1.2	2.0	5.6	4.4	14.5	4.9	38.1	-	3.3	4.8	30.2	1.4	4.3	3.7	24.6
700	0.3	0.9	1.4	4.2	3.4	11.0	3.7	34.4	0.1	3.1	4.7	25.5	1.0	3.3	2.8	21.8
800	0.3	0.6	1.1	3.1	3.2	7.8	3.0	31.5	-	3.1	4.6	20.9	1.0	2.3	2.2	19.6
900	0.3	0.4	0.7	2.4	0.7	7.1	2.2	29.3	-	3.1	4.6	16.2	0.3	2.0	1.6	18.1
1000	0.1	0.3	0.4	2.0	0.5	6.6	2.0	27.3	-	3.1	4.6	11.6	0.2	1.8	1.3	16.7
1500	0.2	0.1	1.3	0.7	2.2	4.4	8.1	19.2	3.1	0.0	11.6	0.0	0.7	1.1	5.2	11.5
2000	0.1	0.0	0.5	0.3	1.6	2.8	5.1	14.2	-	0.0	-	0.0	0.4	0.7	3.1	8.4
3000	0.0	0.0	0.2	0.1	1.1	1.7	6.3	7.8	-	0.0	-	0.0	0.3	0.4	3.8	4.6
3500	0.0	0.0	0.0	0.0	0.5	1.3	2.3	5.6	-	0.0	-	0.0	0.1	0.3	1.3	3.3
4000	0.0	0.0	0.0	0.0	0.4	0.9	1.5	4.0	-	0.0	-	0.0	0.1	0.2	0.9	2.4

Wahoo Recreational Harvest

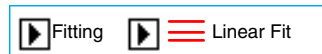
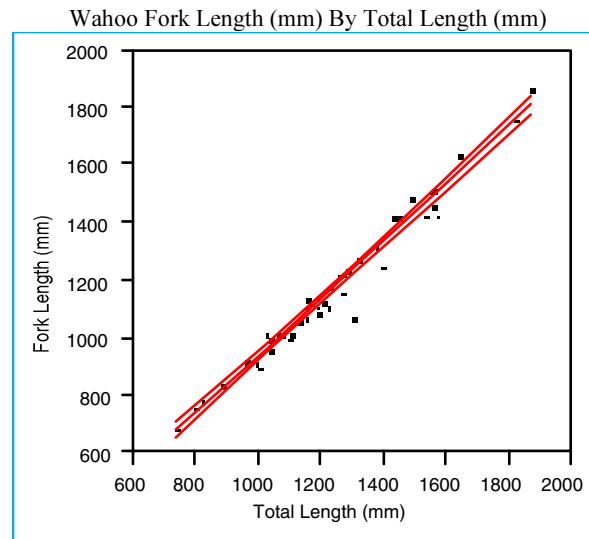
Wahoo Annual Totals

YR	Headboat		Charter		Private/Rental		Total	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
81	110	3,716	106,022	1,615,215	14,386	213,540	120,518	1,832,471
82	130	4,815	627	8,741	21,113	300,914	21,870	314,470
83	161	3,314	10,561	314,696	34,126	749,487	44,848	1,067,497
84	119	3,676	3,347	94,929	16,911	335,281	20,377	433,886
85	96	3,175	3,350	112,214	12,392	443,292	15,838	558,680
86	23,912	900,775	18,370	569,890	36,326	1,254,674	78,608	2,725,338
87	115	4,068	32,202	711,809	23,220	467,049	55,537	1,182,926
88	618	20,173	23,140	513,462	30,707	737,052	54,465	1,270,686
89	95	3,521	8,013	209,285	16,048	586,909	24,156	799,715
90	4,335	142,615	10,021	208,078	11,465	228,561	25,821	579,254
91	125	3,989	20,984	426,385	24,212	560,891	45,321	991,266
92	181	6,643	17,913	390,873	32,753	594,113	50,847	991,629
93	153	4,689	24,789	505,692	28,608	694,614	53,550	1,204,994
94	219	5,385	28,041	550,670	19,822	392,952	48,082	949,007
95	278	8,901	45,669	847,456	30,170	520,836	77,210	1,393,745
96	149	4,366	23,371	564,068	23,875	619,467	47,394	1,187,901
97	258	3,394	52,022	1,068,091	15,669	288,341	67,949	1,359,826

Wahoo Recreational Size Limits

Wahoo All Areas

Size Mm FL	Headboat				Party/Charter				Private/Rental				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %
< 601	-	-	-	-	0.4	0.4	0.0	0.0	0.4	0.4	0.1	0.1	0.4	0.4	0.0	0.0
601-800	26.8	26.8	12.6	12.6	3.2	3.7	0.8	0.9	1.7	2.2	0.5	0.5	3.2	3.6	0.8	0.9
801-900	9.1	35.9	6.9	19.5	5.6	9.2	2.3	3.2	3.7	5.9	1.3	1.8	5.5	9.1	2.2	3.1
901-1000	36.0	71.9	37.2	56.7	8.9	18.2	4.8	8.0	15.6	21.5	8.0	9.9	9.4	18.5	5.1	8.2
1001-1050	18.2	90.1	23.7	80.5	8.9	27.0	6.0	14.0	8.2	29.7	5.0	14.9	8.8	27.3	5.9	14.1
1051-1100	0.1	90.2	0.2	80.7	10.4	37.4	8.0	22.0	11.6	41.3	8.3	23.2	10.5	37.8	8.0	22.1
1101-1150	0.3	90.5	0.5	81.2	10.4	47.8	9.1	31.0	9.9	51.2	8.0	31.2	10.3	48.1	9.0	31.1
1151-1200	9.1	99.6	17.2	98.5	12.1	59.9	12.0	43.0	6.6	57.9	6.1	37.2	11.7	59.8	11.5	42.6
1201-1250	0.1	99.7	0.3	98.7	10.8	70.7	12.0	55.0	6.7	64.6	6.9	44.1	10.5	70.4	11.6	54.2
1251-1300	-	99.7	-	98.7	10.5	81.2	13.1	68.1	10.4	75.0	11.9	56.0	10.5	80.8	13.0	67.2
1301-1350	-	99.7	-	98.7	5.5	86.7	7.6	75.7	3.7	78.6	4.8	60.8	5.3	86.2	7.4	74.6
1351-1400	-	99.7	-	98.7	3.6	90.3	5.6	81.3	4.3	82.9	6.2	67.0	3.6	89.8	5.6	80.2
> 1400	0.3	100.0	1.3	100.0	9.7	100.0	18.7	100.0	17.1	100.0	33.0	100.0	10.2	100.0	19.8	100.0



Linear Fit

$$\text{Fork Length (mm)} = -54.153 + 0.99104 \text{ Total Length (mm)}$$

Summary of Fit

RSquare	0.971017
RSquare Adj	0.970413
Root Mean Square Error	42.61702
Mean of Response	1163.64
Observations (or Sum Wgts)	50

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2920681.4	2920681	1608.118
Error	48	87178.1	1816	Prob>F
C Total	49	3007859.5		<.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-54.15281	30.96017	-1.75	0.0867
Total Length (mm)	0.9910423	0.024713	40.10	<.0001

Nonlinear Fitting Control Panel

_ Second Deriv. Method
 _ Continuous Update
 _ Iteration Log
 _ Loss is -LogLikelihood
 PLCI iter=2 Converged g=9.47e-6
 Converged in the Gradient

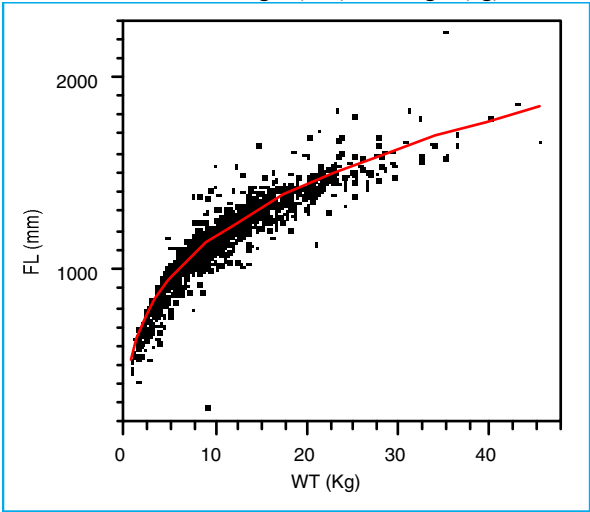
	Current	Limit	Alpha
Iteration	2	60	0.050
Shortening	0	15	
O Criterion	5.587935e-14	0.0000001	
D Criterion	0.0000029098	0.0000001	
G Criterion	0.0000000036	0.000001	
CL Criterion	?	0.00001	

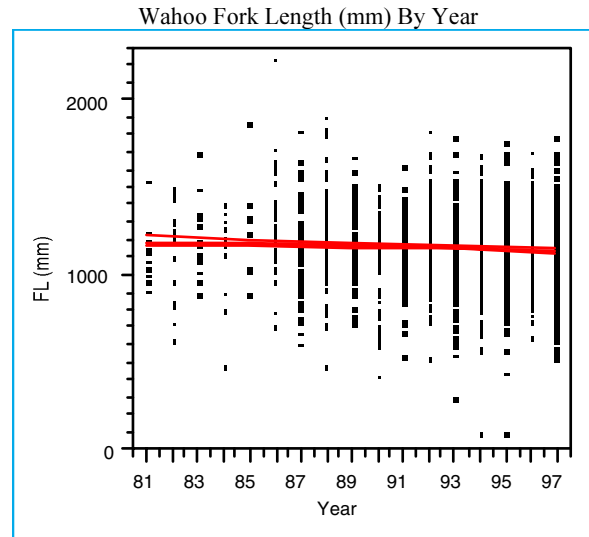
Parameter	Current Value	Lock	SSE
p1	589.06590181	—	9744995.5861
p2	0.3004449317	—	9761113.438

Solution			
SSE	DFE	MSE	RMSE
9744995.5861	2325	4191.396	64.740991

Parameter	Estimate	ApproxStdErr	Lower CL	Upper CL
p1	589.06590181	3.22517103	582.809605	595.390413
p2	0.3004449317	0.00228632	0.29599309	0.30489937

Wahoo Fork Length (mm) on Weight (kg)





☐ Fitting ☒ Linear Fit

Linear Fit

$$FL \text{ (mm)} = 1449.64 - 3.12172 \text{ Year}$$

Summary of Fit

RSquare	0.003002
RSquare Adj	0.002636
Root Mean Square Error	199.036
Mean of Response	1159.642
Observations (or Sum Wgts)	2728

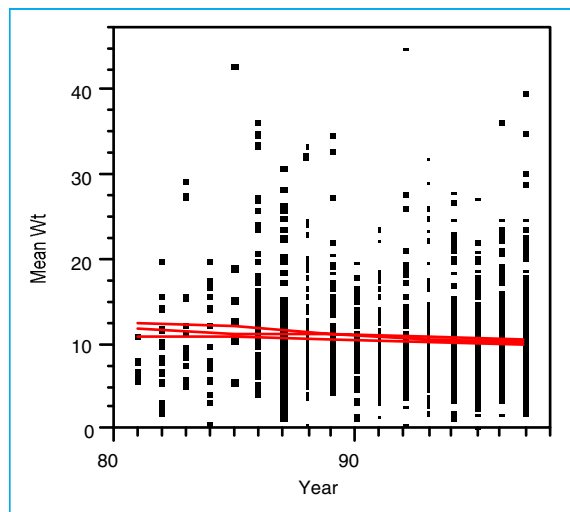
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	325141	325141	8.2075
Error	2726	107991389	39615	Prob>F
C Total	2727	108316530		0.0042

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	1449.6371	101.2964	14.31	<.0001
Year	-3.12172	1.089657	-2.86	0.0042

Wahoo Mean Weight By Year



▣ Fitting
▣ Linear Fit

Linear Fit

Mean Wt = 19.2759 - 0.09255 Year

Summary of Fit

RSquare	0.003729
RSquare Adj	0.003078
Root Mean Square Error	5.579437
Mean of Response	10.71417
Observations (or Sum Wgts)	1532

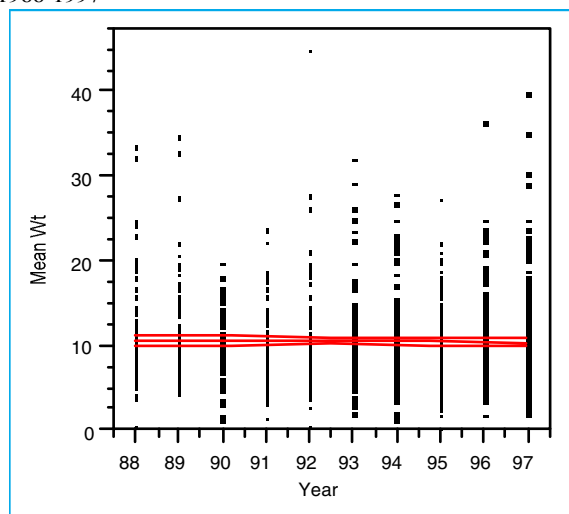
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	178.274	178.274	5.7267
Error	1530	47629.080	31.130	Prob>F
C Total	1531	47807.354		0.0168

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	19.275858	3.580554	5.38	<.0001
Year	-0.09255	0.038674	-2.39	0.0168

Wahoo Mean Weight By Year 1988-1997



Linear Fit

Mean Wt = 13.1362 - 0.02778 Year

Summary of Fit

RSquare	0.000205
RSquare Adj	-0.00054
Root Mean Square Error	5.281206
Mean of Response	10.53934
Observations (or Sum Wgts)	1344

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	7.677	7.6773	0.2753
Error	1342	37429.912	27.8911	Prob>F
C Total	1343	37437.590		0.5999

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	13.136238	4.951842	2.65	0.0081
Year	-0.027781	0.052952	-0.52	0.5999

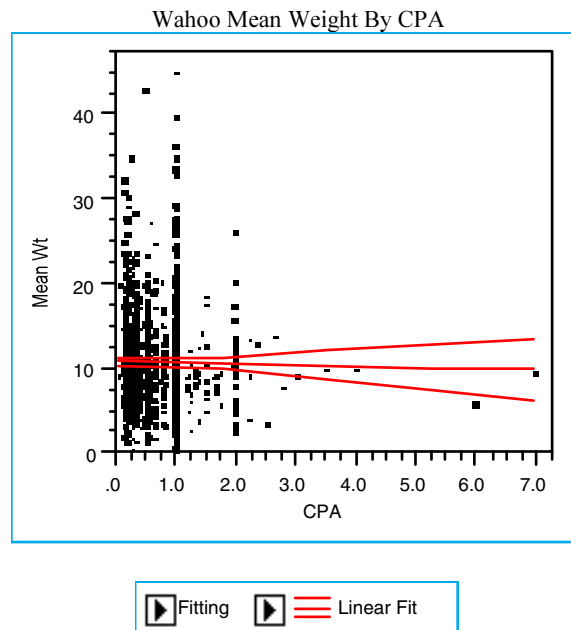
Wahoo Recreational Bag and Trip Limits

Wahoo Bag Limitr\ All Areas

Bag Limit	Headboat				Party/Charter				Private/Rental				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
1	43.8	56.2	51.5	48.5	80.4	19.6	85.3	14.7	80.0	20.0	84.8	15.2	65.9	34.1	73.4	26.6
2	21.7	34.5	21.8	26.7	10.4	9.2	9.0	5.7	8.8	11.2	7.8	7.3	14.8	19.3	13.4	13.2
3	10.8	23.7	10.1	16.7	2.4	6.8	1.8	3.8	2.7	8.5	2.1	5.2	5.7	13.6	4.7	8.4
4	6.5	17.2	5.7	10.9	0.8	6.0	0.5	3.3	0.9	7.6	0.6	4.6	3.1	10.5	2.4	6.1
5	4.2	13.0	3.6	7.4	0.6	5.4	0.3	3.0	0.8	6.8	0.5	4.1	2.0	8.5	1.5	4.6
6	2.9	10.2	2.4	5.0	0.5	5.0	0.3	2.7	0.7	6.1	0.4	3.6	1.4	7.1	1.0	3.6
7	1.9	8.2	1.6	3.4	0.4	4.6	0.2	2.5	0.7	5.4	0.4	3.2	1.0	6.1	0.7	2.9
8	0.9	7.3	0.7	2.7	0.4	4.2	0.2	2.3	0.6	4.8	0.4	2.9	0.6	5.5	0.4	2.5
9	0.2	7.1	0.1	2.6	0.4	3.9	0.2	2.1	0.6	4.2	0.4	2.5	0.3	5.2	0.2	2.3
10	0.2	7.0	0.1	2.5	0.4	3.5	0.2	1.9	0.6	3.6	0.3	2.2	0.3	4.9	0.2	2.1
11	0.1	6.9	0.0	2.5	0.4	3.1	0.2	1.7	0.6	3.1	0.3	1.8	0.3	4.6	0.1	2.0
12	0.1	6.8	0.0	2.5	0.4	2.8	0.2	1.5	0.6	2.5	0.3	1.5	0.3	4.3	0.1	1.8
13	0.1	6.7	0.0	2.4	0.4	2.4	0.2	1.3	0.6	1.9	0.3	1.1	0.3	4.1	0.1	1.7
14	0.1	6.6	0.0	2.4	0.4	2.0	0.2	1.1	0.6	1.3	0.3	0.8	0.3	3.8	0.1	1.5
15	0.1	6.6	0.0	2.4	0.4	1.7	0.2	0.9	0.6	0.8	0.3	0.5	0.3	3.6	0.1	1.4
20	0.4	6.2	0.1	2.2	1.7	0.0	0.9	0.0	0.8	0.0	0.5	0.0	1.1	2.4	0.6	0.8
25	0.4	5.8	0.1	2.1	-	0.0	-	0.0	-	0.0	-	0.0	0.2	2.3	0.0	0.7

Wahoo Trip Limit All Areas

Trip Limit	Headboat				Party/Charter				Private/Rental				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
1	6.4	93.6	11.2	88.8	41.7	58.3	46.4	53.6	60.1	39.9	65.9	34.1	28.9	71.1	37.8	62.2
2	1.9	91.7	2.5	86.3	18.0	40.3	18.5	35.2	12.7	27.2	12.6	21.5	11.3	59.8	13.5	48.7
3	1.7	90.0	2.1	84.2	10.3	30.0	10.1	25.1	6.2	20.9	5.9	15.6	6.7	53.2	7.5	41.1
5	3.1	86.8	3.8	80.4	11.1	18.9	10.4	14.6	6.5	14.4	5.8	9.8	7.7	45.5	8.2	32.9
10	7.0	79.9	8.1	72.3	9.8	9.1	8.6	6.0	5.3	9.1	4.4	5.4	8.4	37.0	8.2	24.8
15	6.0	73.9	6.7	65.6	2.5	6.6	2.0	4.0	1.1	8.0	0.8	4.6	3.8	33.2	3.3	21.5
20	5.3	68.5	5.8	59.8	0.8	5.8	0.6	3.4	0.6	7.5	0.3	4.3	2.6	30.6	2.0	19.5
25	4.6	63.9	4.9	54.9	0.4	5.3	0.3	3.2	0.5	7.0	0.3	4.0	2.1	28.6	1.6	17.9
30	4.2	59.6	4.4	50.6	0.4	5.0	0.2	3.0	0.5	6.5	0.3	3.7	1.9	26.6	1.4	16.5
40	7.8	51.8	7.9	42.6	0.7	4.2	0.4	2.5	1.0	5.5	0.6	3.2	3.5	23.1	2.6	13.9
50	6.6	45.2	6.5	36.2	0.7	3.5	0.4	2.1	1.0	4.6	0.5	2.6	3.1	20.0	2.2	11.8
75	12.7	32.6	12.0	24.1	1.8	1.7	1.1	1.0	2.4	2.2	1.4	1.3	6.1	13.9	4.2	7.6
100	7.8	24.8	7.0	17.2	1.7	0.0	1.0	0.0	2.2	0.0	1.3	0.0	4.1	9.8	2.7	4.9



Linear Fit
Mean Wt = 10.7859 0.12574 CPA

Summary of Fit

RSquare	0.000121
RSquare Adj	-0.00053
Root Mean Square Error	5.58953
Mean of Response	10.71417
Observations (or Sum Wgts)	1532

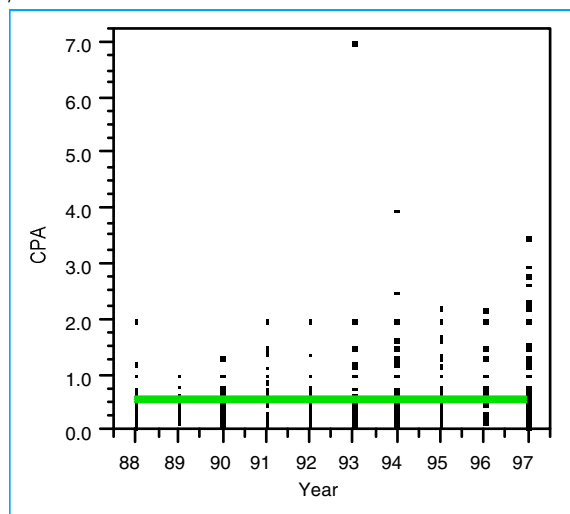
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	5.808	5.8084	0.1859
Error	1530	47801.546	31.2428	Prob>F
C Total	1531	47807.354		0.6664

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	10.785931	0.219302	49.18	0.0000
CPA	-0.125743	0.291631	-0.43	0.6664

Wahoo CPA By Year 1988-1997



Linear Fit

$$\text{CPA} = 0.77166 - 0.00236 \text{ Year}$$

Summary of Fit

RSquare	0.000181
RSquare Adj	-0.00056
Root Mean Square Error	0.478131
Mean of Response	0.550983
Observations (or Sum Wgts)	1344

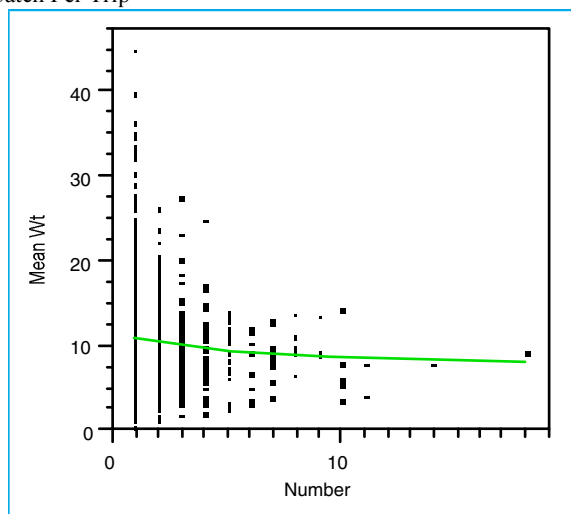
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.05544	0.055441	0.2425
Error	1342	306.79337	0.228609	Prob>F
C Total	1343	306.84881		0.6225

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	0.7716632	0.448312	1.72	0.0854
Year	-0.002361	0.004794	-0.49	0.6225

Wahoo Mean Weight (kg) By Catch Per Trip



Transformed Fit to Log
Mean Wt = 10.8536 - 0.94241 Log(Number)

Summary of Fit

RSquare	0.009649
RSquare Adj	0.008911
Root Mean Square Error	5.256204
Mean of Response	10.53934
Observations (or Sum Wgts)	1344

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	361.239	361.239	13.0753
Error	1342	37076.350	27.628	Prob>F
C Total	1343	37437.590		0.0003

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	10.853575	0.167655	64.74	0.0000
Log(Number)	-0.94241	0.260624	-3.62	0.0003

Wahoo Commercial Landings

Wahoo Commercial Totals by Gear-All years

Gear	N Rows	Pounds	% Pounds
Combined Gears	45	1278379	42.50
Not Coded	4	656797	21.83
Lines Long Set With Hooks	80	586741	19.51
Lines Troll Other	29	244463	8.13
Lines Hand Other	56	186817	6.21
Floating Traps (Shallow)	1	15882	0.53
Lines Long Reef Fish	4	10120	0.34
Reel Electric or Hydraulic	5	8465	0.28
Rod and Reel	8	8441	0.28
Gill Nets Drift Runaround	5	7200	0.24
Trawl Midwater Paired	2	3445	0.11
Gill Nets Sink/Anchor Other	2	1019	0.03
Lines Long Shark	1	221	0.01
Gill Nets Drift Other	2	63	0.00
Lines Troll Tuna	2	37	0.00
Gill Nets Drift Large Pelagic	1	16	0.00
Dredge Scallop Sea	1	14	0.00

Wahoo Commercial Totals by State All years

State	N Rows	Pounds	% Pounds
Louisiana	13	1572783	52.08
Florida West Coast	24	527182	17.46
Florida East Coast	24	330205	10.93
North Carolina	19	266503	8.82
Texas	9	132063	4.37
South Carolina	17	130089	4.31
Rhode Island	4	16252	0.54
New Jersey	10	11565	0.38
New York	14	8361	0.28
Georgia	6	7175	0.24
Alabama	3	6743	0.22
Maryland	8	2941	0.10
Virginia	14	2750	0.09
Mississippi	1	2718	0.09
Massachusetts	4	1327	0.04
Connecticut	2	1241	0.04

Wahoo Commercial Totals by State 94-97

State	N Rows	Pounds	% Pounds
Louisiana	4	513534	51.76
Florida West Coast	4	183631	18.51
North Carolina	4	107871	10.87
Florida East Coast	4	88069	8.88
South Carolina	4	41719	4.20
Texas	4	22466	2.26
Rhode Island	4	16252	1.64
New Jersey	4	6990	0.70
New York	4	5616	0.57
Georgia	2	3775	0.38
Maryland	3	2002	0.20
Massachusetts	2	122	0.01
Virginia	2	109	0.01
Connecticut	1	41	0.00

Wahoo All Areas

Gear	1994	1995	1996	1997
Hook & Line	63,778	95,177	73,275	95,280
Longline	26,840	30,590	31,878	34,809
Other	19,391	4,257	555	1,718
Unknown	140,677	135,576	127,369	133,162
Total	250,404	265,314	232,789	264,678

Wahoo Commercial Size Limits

Wahoo All Areas

Size Mm FL	Hand Line				Long Line				Other				Total			
	Number		Weight		Number		Weight		Number		Weight		Number		Weight	
	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %
	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %	Int %	Cum %
< 600	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
601-800	2.5	2.5	0.8	0.8	0.9	0.9	0.2	0.2	-	-	-	-	2.3	2.3	0.7	0.7
801-900	7.3	9.8	2.9	3.7	12.3	13.2	4.2	4.4	-	-	-	-	7.7	10.0	3.0	3.8
901-1000	12.7	22.5	7.1	10.7	12.5	25.7	6.7	11.1	-	-	-	-	12.7	22.8	7.0	10.8
1001-1050	9.8	32.4	6.6	17.3	12.5	38.2	7.8	18.9	-	-	-	-	10.0	32.8	6.7	17.5
1051-1100	13.0	45.4	9.7	27.1	5.3	43.6	3.6	22.5	-	-	-	-	12.4	45.2	9.2	26.7
1101-1150	8.3	53.7	7.1	34.2	4.0	47.6	3.2	25.7	-	-	-	-	8.0	53.2	6.8	33.5
1151-1200	6.8	60.5	6.7	40.9	3.7	51.3	3.1	28.9	-	-	-	-	6.6	59.8	6.4	39.9
1201-1250	5.9	66.4	6.2	47.1	3.8	55.1	3.8	32.6	-	-	-	-	5.7	65.5	6.0	45.9
1251-1300	8.0	74.4	9.5	56.6	10.3	65.4	11.5	44.1	-	-	-	-	8.2	73.8	9.7	55.6
1301-1350	5.8	80.2	7.7	64.3	12.5	78.0	15.2	59.3	-	-	-	-	6.3	80.0	8.3	63.9
1351-1400	6.5	86.7	9.5	73.8	8.2	86.2	11.3	70.6	-	-	-	-	6.6	86.6	9.6	73.5
1401-1450	3.9	90.6	6.4	80.2	2.2	88.4	3.4	73.9	-	-	-	-	3.8	90.5	6.1	79.7
1451-1500	2.8	93.4	5.1	85.2	4.0	92.4	6.6	80.5	-	-	-	-	2.9	93.3	5.2	84.9

Wahoo Commercial Trip Limits

Wahoo All Areas

Trip Limit	Hand Line/R&R				Long Line				Other				Total			
	Trips		Weight		Trips		Weight		Trips		Weight		Trips		Weight	
	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red
	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red	Int %	% Red
0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0	-	100.0
50	64.8	35.2	54.7	45.3	36.3	63.7	28.6	71.4	87.3	12.7	92.1	7.9	50.1	49.9	36.2	63.8
100	24.1	11.1	15.3	29.9	22.5	41.2	17.1	54.3	12.7	0.0	7.9	0.0	23.3	26.6	16.6	47.2
150	4.2	7.0	6.5	23.4	11.9	29.2	11.6	42.8	-	0.0	-	0.0	8.2	18.5	10.1	37.1
200	2.6	4.4	4.2	19.2	6.7	22.6	8.6	34.2	-	0.0	-	0.0	4.7	13.8	7.3	29.8
250	2.0	2.3	2.5	16.7	4.8	17.7	6.7	27.5	-	0.0	-	0.0	3.5	10.3	5.4	24.3
300	0.4	2.0	1.6	15.1	3.5	14.2	5.2	22.2	-	0.0	-	0.0	2.0	8.3	4.2	20.2
350	0.3	1.7	1.4	13.8	2.4	11.8	4.4	17.9	-	0.0	-	0.0	1.4	6.9	3.5	16.7
400	0.3	1.4	1.2	12.6	2.5	9.3	3.5	14.4	-	0.0	-	0.0	1.4	5.5	2.8	13.9
450	0.1	1.3	1.0	11.6	1.7	7.7	2.8	11.6	-	0.0	-	0.0	0.9	4.6	2.3	11.6
500	0.1	1.2	1.0	10.7	1.5	6.2	2.3	9.3	-	0.0	-	0.0	0.8	3.8	1.9	9.7
750	0.7	0.4	3.1	7.5	4.2	2.0	6.1	3.2	-	0.0	-	0.0	2.5	1.3	5.2	4.4
1000	0.2	0.2	1.3	6.3	1.5	0.5	2.2	1.0	-	0.0	-	0.0	0.9	0.4	1.9	2.5
1500	0.1	0.1	1.3	5.0	0.4	0.1	0.7	0.3	-	0.0	-	0.0	0.3	0.1	0.8	1.7
2000	-	0.1	0.8	4.2	0.1	0.0	0.2	0.1	-	0.0	-	0.0	0.0	0.1	0.4	1.3
2500	-	0.1	0.8	3.4	0.0	0.0	0.0	0.1	-	0.0	-	0.0	0.0	0.1	0.3	1.1

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Appendix I. Comments on the Draft Environmental Impact Statement



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8900

November 5, 2001

Dr. Joseph E. Powers
National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702

SUBJ: EPA NEPA Review of NMFS DEIS for Fishery Management Plan for the
Dolphin and Wahoo Fishery of the Atlantic, Caribbean, and Gulf of Mexico;
CEQ Number 010350

Dear Dr. Powers:

Pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed the subject National Marine Fisheries Service (NMFS) Draft Environmental Impact Statement (DEIS) prepared by the South Atlantic Fishery Management Council (Council) in cooperation with the New England Fishery Management Council, Caribbean Fishery Management Council and Gulf of Mexico Fishery Management Council (Councils) for the Fishery Management Plan (FMP) for dolphin (common dolphin - *Coryphaena equisetis* and pompano dolphin - *C. hippurus*) and wahoo (*Acanthocybium solandri*) fisheries.

The dolphin and wahoo fisheries are primarily recreational, particularly the dolphin fishery. The proposed FMP is somewhat proactive since both fisheries are currently healthy and not overfished. However, there are areas of localized reductions and some areas of use conflicts now exist between recreational and commercial (long line) fishers. In general, the FMP proposes to regulate a large fishery management unit (U.S. waters of the Atlantic, Gulf of Mexico and Caribbean EEZ) and promulgate dealer, vessel, and operator permits to gather fishery data to better understand the two fisheries; provide non-binding caps on both recreational and commercial landings to allocate the resource and reduce fisher use conflicts; and set bag and size limits to protect fish abundance and the harvesting of juveniles (e.g., "chicken" dolphin). Specifically, the DEIS lists (pg. xviii) the following management objectives of the FMP: "(1) address localized reduction in fish abundance, (2) minimize market disruption, (3) minimize conflict and/or competition between recreational and commercial user groups, (4) optimize the social and economic benefits, (5) reduce bycatch in the dolphin fishery, (6) direct research to evaluate the role of dolphin and wahoo as prey and predators in the pelagic ecosystem, and (7) direct research to enhance collection of biological, habitat, social, and economic data on dolphin and wahoo stocks and fisheries."

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Overall, EPA supports the proposed dolphin and wahoo FMP. However, we offer the following comments on the NEPA process and have enclosed additional comments on the FMP:

* *NEPA Document* - Compared to previous FMP EISs reviewed by EPA, the present DEIS is more consistent with the NEPA process. We note that background information, management objectives/goals, and options to proposed actions are provided. Moreover, we note that the specific management objectives addressed by individual proposed actions are itemized in the discussion/conclusion sections for those actions. This serves to relate the actions to the FMP objectives.

In addition to such a listing of applicable proposed actions for each management objective, we recommend that a summary table be provided in the FEIS where all actions applicable to each management objective are listed by objective so that the public can readily determine which actions will satisfy each management goal. In the text, NMFS may also wish to more specifically discuss how each proposed action would satisfy specific goals. A summary of how bycatch, for example, would be reduced by the FMP objectives would be of public interest.

Despite NEPA improvements, the DEIS is somewhat cumbersome given that 28 actions are proposed with as many as seven options for these actions. While we support the NEPA concept of reasonable alternatives (options), instances were noted where options could have been lumped into the action and others where the options should have been split into two options since ranges were offered and selections were not yet made. In some cases, the rationale for rejection of options needed further clarification. Some streamlining in the FEIS and future NEPA documents may be possible and should be considered. The summary tables (e.g., Table 3) for the various actions and options are helpful.

* *Public Acceptance* - Regarding previous (1989) consideration for managing dolphin and wahoo, page 4 states that "...the Councils decided to forego any management for dolphin due to lack of support for any specific measures at that time." While we understand that public support and involvement is desirable to management success, it is fishery data (landings, stock biomass, etc.) that are key in determining the need for a FMP more so than public receptiveness. Historically, fishery restrictions (bag limits, minimum size, reporting, permits, etc.) are often not welcomed by commercial or recreational fishers, particularly for a previously unregulated fishery such as the present dolphin and wahoo fisheries.

* *Role of Federal Lead Agency* - Page 5 states that "(t)he Councils concluded this meets the intent of NEPA." While we understand the important role and expertise of the Councils, they are not federal agencies. Accordingly, we believe that NMFS, as the lead federal agency, should determine NEPA compliance of the federal DEIS. Therefore, the above passage should perhaps read in the FEIS as "NMFS concluded this meets the intent of NEPA," or perhaps as "NMFS and the Councils concluded this meets the intent of NEPA." Other such statements regarding NEPA compliance and the role of the federal lead agency versus the technical role of the Councils should be revisited for the FEIS. Conversely, we are pleased to note that page 178, referring to

Action 5, states that "(t)his option is strongly supported by the National Marine Fisheries Service and many vessel owners."

* *Framework Procedure* - We agree with the use of the framework procedure to quickly modify a FMP where additional information or discussion makes such modification necessary (adaptive management). The NEPA process, however, would still need to be served under framework modifications. We assume that NMFS will ensure NEPA compliance during the framework process.

* *Options* - As suggested above, some options proposed in the DEIS themselves offer a range of choices. For example, Option 2 for Action 15 (proposing a 20-inch fork length (FL) as a minimum size for dolphin) offers an 18- to 24-inch FL range and suggests that a final FL will be chosen. Options to a proposed action should preferably provide only one FL, i.e., two options should have been presented -- one above 20 inches and one below 20 inches. Since Option 2 offers a range above and below 20 inches, its merits are difficult to comment on by resource agencies and the public. Conversely, other ranges presented in the DEIS such as for the maximum sustainable yield (MSY: Action 7) are appropriate since they present a statistical confidence limit range. However, even in such instances, the need to settle on one MSY value -- such as an average MSY -- seems appropriate.

We also note that Options 2 and 3 for Action 23 seem more consistent with the proposed action than variants to the proposed action. The FEIS should revisit these and revise them as needed, or better identify differences between the options and Action 23.

* *List of Acronyms & Glossary* - Because of the technical nature of fishery science, we recommend that the FEIS include a *List of Acronyms* and a *Glossary* to make the document more user-friendly to the general public (e.g., MSY, SPR, F, OY, FL, RecFIN, ComFIN, fecundity, pelagic, proxy, *Sargassum*, etc.). Although several such terms are defined in the DEIS, their consolidation would facilitate public reviews. Similarly, when listing taxonomic fish families (as was done for the gut analysis for dolphin in Chapter 3: pg. 31), we suggest that the common name also be included with the family name (e.g., Scombridae: mackerels & tunas). In addition, we suggest that the FEIS summarize the concept of Essential Fish Habitat (EFH) in pelagic waters where bottom habitat would not be damaged by fishing gear or most development as it would for EFHs in inshore waters. For example, how would the expansive and meandering Gulf Stream, which is proposed as a dolphin and wahoo EFH in Action 22, be protected as an EFH? Also, we suggest that local terms such as "chicken" dolphin (juvenile dolphin) be further defined as to size (<18-inch FL?) and other characteristics.

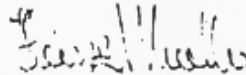
In addition to the above NEPA process comments, EPA has provided comments and recommendations on the 28 proposed actions of the FMP and their options in the enclosed *Detailed Comments*. Some of our potential concerns include that similar but nevertheless different species and congeners are lumped into one FMP, that permit fees are required in some regions but not in all regions of the management unit, that operators of for-hire vessels will still

be able to sell dolphin and wahoo which may affect the assurance of food quality standards, that the proposed minimum size limit for dolphin would only apply to portions of the Atlantic, the current NMFS position on the harvesting of *Sargassum* weed particularly as it relates to dolphin and wahoo EFH and the status of the *Sargassum* FMP, and the mechanism for the enforcement of the proposed FMP. We suggest additional discussion in the FEIS.

In summary, EPA conceptually supports the proposed FMP for dolphin and wahoo and will primarily defer to the expertise of the NMFS and the Councils on the bases and assumptions for the proposed actions. However, our NEPA and FMP comments should be considered/clarified by the NMFS/Councils in their development of the pending FEIS as well as future fishery EISs. We rate this DEIS an "EC-1" (Environmental Concerns) due to our NEPA and FMP comments.

Should you have questions regarding these comments, you may wish to contact Chris Hoberg of my staff at 404/562-9619.

Sincerely,



Heinz J. Mueller, Chief
Office of Environmental Assessment
Environmental Accountability Division

Enclosure

DETAILED COMMENTS

EPA offers the following comments on the FMP actions and their options for the NMFS/Councils consideration in the development of the FEIS:

o Management Measures for U.S. Waters of the Atlantic, Caribbean and Gulf of Mexico

Action 1 (Management Unit for Dolphin) - We note that the range for the dolphin is broad geographically (Nova Scotia to Brazil) as is the range of the management unit (Atlantic EEZ to the Caribbean EEZ). However, samples within the range indicated no genetic differences and tagging information shows that dolphin move within the range. Accordingly, it seems reasonable that one management plan for dolphin is appropriate for the management unit. It is unclear, however, if both the common dolphin and the pompano dolphin, which are both to be regulated under the same FMP, were examined genetically and via tagging. While differences may not exist within a species, physical and behavioral differences could exist between dolphin congeners. The FEIS should clarify. The DEIS indicates, for example, that pompano dolphin are a smaller-sized species and prefer warmer waters than the common dolphin.

+ ***Option 1 for Action 1 (No Action)*** - In regard to management of dolphin at a time when the stock appears healthy (pg. 163), we do not disagree with such a proactive NMFS regulation if it is followed by adaptive management of the proposed FMP through the framework process. We note that conflicts between commercial and recreational fishers have occurred, that juvenile “chicken” dolphin are being harvested and that areas of localized reductions have occurred, which suggest that some regulation is already appropriate at this time. As such, we agree with the NMFS rejection of Option 1. However, given the many species being overfished, it is arguable that resources needed for this FMP may be more needed for those species with stocks in greater jeopardy -- unless these species are also already being fully managed. We will defer to the expertise of the NMFS and Councils.

* ***Action 2 (Management Unit for Wahoo)*** - The biology and stock status of wahoo is less known than for dolphin. However, the pelagic distribution appears similar and like dolphin, there appears to be movement within the range. Wahoo and dolphin are also harvested by some of the same fishers. It therefore may not be unreasonable to lump wahoo with dolphin in the same FMP and management unit (Atlantic, Caribbean and Gulf of Mexico EEZ). However, given that two different species with different genera are involved and data are limited, separate FMPs may ultimately be more appropriate if a need is identified through the proposed collection of reporting data.

+ ***Option 1 for Action 2 (No Action)*** - We agree with the NMFS rejection of Option 1 in an effort to compile data to better understand wahoo stocks. Again, adjustment to the proposed FMP appear likely as data become available.

* ***Action 3 (Dealer Permits for Atlantic and Gulf)*** - EPA agrees with the use of dealer permits in order to better assess dolphin and wahoo landings and changes in landings. In regard to the fee for these permits, NMFS may wish to consider waiving this cost since the information gathered by the dealers is invaluable to the understanding of the two fisheries. The permit fees are also nominal so that revenues would not seem to be a significant gain or loss to the agency. If not waived, however, we suggest that the proposed federal use of the permit fees be disclosed (e.g., fisheries management, enforcement, conservation, permit processing, NMFS policy, etc.) in the FEIS.

+ ***Option 1 for Action 3 (No Action)*** - We agree with the NMFS rejection of Option 1 so that the two fisheries will be monitored.

+ ***Option 2 for Action 3 (Dealer Permits for Caribbean)*** - This option proposes a permit and fee for the Caribbean. The Councils have rejected this option since the fees might be an economic burden for Caribbean dealers which may also be fishers and vessel owners, which require additional permits and fees. EPA does not disagree in the sense that we believe that the permit fees might be waived in general, as suggested above. With or without fees, however, we believe that dealer reporting of landings should be required through permits for all subregions of the management unit (Atlantic, Gulf and Caribbean) in order to monitor the two fisheries and for comparisons. It may be argued, however, that if fees are charged in the Atlantic and Gulf but not the Caribbean, some discontent may develop among U.S. dolphin and wahoo fishers.

+ ***Option 3 for Action 3 (State vs. Federal Permits for Caribbean)*** - For Option 3, EPA defers to the NOAA General Counsel which has "indicated that pursuant to the Magnuson-Stevens Act, it was not feasible to defer to local government permits for harvest and possession of a Federally managed species"(pg. 171).

* ***Action 4A (Vessel Permits for Atlantic and Gulf)*** - We concur with the action to require the owners of for-hire vessels to obtain a NMFS permit to harvest or possess wahoo or dolphin so that the number of commercial fishing vessels and commercial effort can be determined. A nominal fee would be charged. As indicated above for dealer fees, NMFS may wish to waive this fee considering the value of such a permitting requirement to the understanding of the two species.

Action 4B (Specifics for Vessel Permits for Atlantic) - We concur with the presented specifics regarding the need for a vessel permit such as a permit being required if at least 25% of the vessel owner's income was derived from commercial or for-hire fishing. It is unclear, however, as to why a 200-pound wahoo and dolphin bycatch possession limit is allowed for permitted commercial fishers fishing north of 39 degrees North latitude. It is also unclear how such permitting will be enforced. The FEIS should discuss.

+ ***Option 1 for Actions 4A and 4B (No Action)*** - EPA agrees with the NMFS rejection of this option so that the two fisheries can be further characterized through vessel

permitting.

*** Action 4C (Vessel Permits Without Fees for Caribbean)** - Due to the economics of the Caribbean subregion, the Councils propose that no permitting fee be charged but that the vessel permitting process be initiated.

As suggested above, we believe that vessel permits should be required for all subregions within the management unit for dolphin and wahoo. With or without fees, the permitting should be consistent within the management unit. It may be argued, however, that if fees are charged in the Atlantic and Gulf but not the Caribbean, some discontent may develop among U.S. dolphin and wahoo fishers.

+ Option 1 for Action 4C (No Action) - EPA agrees with the NMFS rejection of this option so that the two fisheries can be further characterized through vessel permitting.

Action 5 (Operator Permits for Atlantic and Gulf) - EPA agrees with the requirement of an operator's permit for commercial or for-hire vessels to harvest or possess dolphin or wahoo. We particularly agree that the operator must be onboard, is held accountable for violations of fishery regulations, and that the permit is not transferable and can be revoked and sanctioned.

+ Option 1 for Action 5 (No Action) - We concur with the NMFS rejection of this option to minimize onboard violations of the FMP and other fishery regulations.

+ Option 2 for Action 5 (Operator Permits for Caribbean) - EPA disagrees with the apparent proposed permit exemption for Caribbean operators. The argument that the Caribbean fishery shows no sign of decline can be made for many other areas within the management unit. We suggest that this option be revisited in the FEIS and that Action 5 perhaps be modified to include the Caribbean. This would provide consistency across the management unit, allow comparison against the Atlantic and Gulf, and help ensure FMP compliance in the Caribbean. EPA would not oppose waiving a permit fee, but believes the permitting process and enforcement should be consistent within the management unit.

Action 6: SubAction 6A (Reporting Requirements for Atlantic) - EPA will defer to the NMFS expertise regarding data collection techniques and analysis such as the listed ACCSP, RecFIN, ComFIN and the existing logbook requirements. EPA recommends use of standardized methodology and consistency within the management unit to allow regional comparisons

*** Action 6: SubAction 6B (Reporting Requirements for Gulf and Caribbean)** - EPA will defer to the NMFS expertise regarding data collection techniques and analysis. Techniques for Gulf and Caribbean will apparently be developed through the framework process. EPA recommends use of standardized methodology and consistency within the management unit to allow regional comparisons.

+ Option 1 for Action 6 (No Action) - We concur with the NMFS rejection of this option so that data can be appropriately reduced and interpreted.

* **Action 7 (Dolphin & Wahoo Maximum Sustainable Yield: MSY)** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of the MSY for both dolphin and wahoo. We also understand that the MSY is based on the spawning stock size (biomass) preferred by NMFS/Councils. While we understand that the ranges provided represent 80% confidence levels, it would seem that one figure such as the mean be disclosed and used in analysis. The FEIS should discuss.

+ Option 1 for Action 7 (No Action) - We concur with the NMFS rejection of this option since the MSY estimate is essential to the management of dolphin stocks and required (or an MSY proxy) by the Magnuson-Stevens Act.

+ Option 2 for Action 7 (Other MSY Estimates) - We defer to the NMFS and Councils regarding the preference for biomass-derived MSY estimates as presented in Action 7.

+ Option 3 for Action 7 (Other MSY Estimates) - We defer to the NMFS and Councils regarding the preference for biomass-derived MSY estimates as presented in Action 7.

* **Action 8 (Dolphin & Wahoo Optimum Yield: OY)** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of the OY for both dolphin and wahoo. OY is defined as “the maximum number of fish that can be harvested safely as reduced by social, economic, and ecological features.” We are pleased to note that while the OY is often less than MSY it cannot exceed MSY and that ecological features can result in reduced landings. The FEIS should further discuss what specific ecological considerations would be implemented for this FMP.

+ Option 1 for Action 8 (No Action) - We concur with the NMFS rejection of this option to prevent overfishing.

+ Option 2 for Action 8 (Other OY Estimates) - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8.

+ Option 3 for Action 8 (Other OY Estimates) - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8.

+ Option 4 for Action 8 (Other OY Estimates) - We defer to the NMFS and Councils regarding the preference for biomass-derived OY estimates as presented in Action 8. Also, data presently do not exist to calculate spawning stock size (biomass) by subregions.

* **Action 9 (Overfishing)** - EPA will defer to the expertise of the NMFS and Councils regarding the best estimate of fishing mortality and other components involved in estimating the

overfishing estimate for both dolphin and wahoo.

+ Option 1 for Action 9 (No Action) - We concur with the NMFS rejection of this option to prevent overfishing.

* **Action 10 (Framework Procedure)** - We agree with adjustments to the proposed FMP through the framework procedure to expedite modifications. However, NEPA compliance will still be necessary for such adaptive management.

+ Option 1 for Action 10 (No Action) - We concur with the NMFS rejection of this option to allow rapid FMP modifications.

o Management Measures for U.S. Waters of the Atlantic

Action 11 (Sale of Dolphin & Wahoo) - We agree that dolphin and wahoo should not be sold by recreational fishers. However, this action exempts for-hire vessels with commercial permits that comply with regulations, which are allowed to sell dolphin and wahoo. EPA can only agree with this exception if the commercial permits for the for-hire vessels require the food quality standards of commercial vessels. It is also unclear as to why Action 11 is only proposed for the Atlantic subregion. The FEIS should discuss.

+ Option 1 for Action 11 (No Action) - We concur with the NMFS rejection of this option since recreational fishers can avoid food quality standards that commercial fishers cannot legally avoid.

+ Option 2 for Action 11 (Phase-Out Period) - This option proposes to phase out the for-hire vessel exemption in 3-5 years so that only true commercial vessels will eventually be able to sell dolphin and wahoo. We do not disagree with the NMFS rejection of Option 2 if the for-hire vessels indeed are bound by commercial food quality standards.

+ Option 3 for Action 11 (Prohibit For-Hire Vessels Sales) - This option would limit the sale of dolphin and wahoo to commercial vessels. Again, we do not disagree with the NMFS rejection of Option 3 if the for-hire vessels indeed are bound by commercial food quality standards. However, EPA favors Option 3 since it provides the best assurance for food quality standards. On the other hand, it does present some societal and economic issues for for-hire vessels.

Action 12 (Commercial Landings Cap) - Although not a rigorous Total Allowable Catch (TAC), this action caps commercial landings at 13% of total landings or 1.5 M pounds, whichever is greater. These caps are based on the average of recent fishery statistics (1994-1997), including the highest (1995) landings (Note - It is unclear why Action 12 (Atlantic EEZ) and Action 27 (Gulf EEZ) used significantly different baseline years; the FEIS should discuss.).

Although the NMFS can adjust the caps if exceeded, this non-binding cap offers a target that should perhaps evolve into a TAC as data become available. EPA agrees with capping commercial landings to help resolve commercial/recreational fisher use conflicts.

+ Option 1 for Action 12 (No Action) - We concur with the NMFS rejection of this option in order to set a cap, albeit non-binding, and to help resolve fisher use conflicts.

+ Option 2 for Action 12 (Historical Catch) - Option 2 bases the cap on historical landings from one of several time periods different from proposed Action 12. We will defer to the NMFS regarding the selection of the appropriate time frame but favor recent landings used in Action 12.

+ Option 3 for Action 12 (Gear Types) - Option 2 bases the cap on gear types by different parts of the subregion. We will defer to the NMFS regarding the selection of the appropriate time frame but favor the statistics used in Action 12.

* **Action 13 (Bag Limit)** - This action proposes a 10 dolphin per person per day and 60 dolphin per boat per day limit. We conceptually agree with bag limits and will defer to the NMFS regarding the basis of these limits. This action serves to cap recreational fishing.

+ Option 1 for Action 13 (No Action) - We concur with the NMFS rejection of this option in order protect dolphin abundance.

+ Option 2 for Action 13 (Reduced Dolphin Bag Limit Per Boat Per Day) - We agree with the NMFS rejection of Option 2 regarding dolphin bag limits for for-hire vessels (18-60 per vessel per day) since we will defer to the expertise of the NMFS/Councils proposing Action 13 bag limits. However, the lower bag limit proposed in Option 2 (18 vs. 60) would provide greater protection of stock abundance. From a NEPA standpoint, this option is vague since it provides a wide range rather than a distinct bag limit.

+ Option 3 for Action 13 (Reduced Dolphin Bag Limit Per Person Per Day) - We agree with the NMFS rejection of Option 3 regarding dolphin bag limits for fishers (5-10 per person per day) since we will defer to the expertise of the NMFS/Councils proposing Action 13 bag limits. However, the lower bag limit proposed in Option 3 (5 vs. 10) would provide greater protection of stock abundance. From a NEPA standpoint, this option is vague since it provides a wide range rather than a distinct bag limit.

+ Option 4 for Action 13 (Bag Limit Exemptions) - We agree with the NMFS rejection of Option 4 proposing Action 13 bag limits with an exemption for headboats fishing in waters north of 39 degrees North Latitude since we will defer to the expertise of the NMFS/Councils proposing Action 13 bag limits. Such exemptions would allow greater landings and therefore reduce dolphin abundance. The basis of such an exemption is also unclear.

* ***Action 14 (Commercial Trip Limits)*** - EPA conceptually agrees with a limit on commercial dolphin landings per trip (3,000 pounds per trip north of 31 degrees North Latitude and 1,000 pounds south) and agrees that no at-sea catch transfers should be allowed. We will defer to the expertise of the NMFS/Councils regarding the basis for these limits. However, the basis for these limits is somewhat unclear (data vs. maintenance of status quo and public opinion). The basis and regional differences should be better discussed in the FEIS.

+ *Option 1 for Action 14 (No Action)* - We concur with the NMFS rejection of this option in order to limit the amount of fishing effort in the dolphin commercial fishery.

+ *Option 2 for Action 14 (1,000-5,000 Pound Trip Limits)* - We agree with the NMFS rejection of Option 2 since we will defer to the expertise of the NMFS/Councils proposing Action 14 trip limits. The increased limits proposed in Option 2 (5,000 vs. 3,000 pounds) would impact abundance.

Action 15 (Dolphin Size Limits) - We conceptually agree with setting a minimum size limit south of Georgia and defer to the expertise of the NMFS/Councils regarding the basis for Action 15 size limits of a 20-inch FL. We understand (pg. 224) that most common dolphin mature at a FL of 18 inches so that it is likely that dolphin will have spawned by the time they have reached the proposed minimum size limit. The size limit would also prevent harvest of juvenile "chicken" dolphin and reduce the harvest of the smaller pompano dolphin species (parenthetically, the FL size range of juvenile "chicken" or "peanut" dolphin should be defined in the FEIS). It would also raise the current limit of an 18-inch FL in Georgia.

The basis for the exemption of a size limit for waters north of Georgia should be further discussed in the FEIS. We note (pg. 228) that the proposal for no size limit in South Carolina is to reduce the number of dolphin regulatory discards which may or may not survive.

+ *Option 1 for Action 15 (No Action)* - We agree with the rejection of this option in order to reduce the taking of young dolphin that become sexually mature at 18-inch FL.

+ *Option 2 for Action 15 (18 to 24-inch FL Size Limit)* - We agree with the NMFS rejection Option 2 since the lower FL range would allow harvesting of young (just sexually-mature) dolphin. From a NEPA perspective, Option 2 is also vague since it provides a range rather than a distinct minimum size limit such as provided in Action 15.

Action 16 (Wahoo Commercial Trip Limit of 500 Pounds) - EPA conceptually agrees with a limit on commercial wahoo landings per trip and agrees that no at-sea catch transfers should be allowed. We will defer to the expertise of the NMFS/Councils regarding the basis for this limit.

Although somewhat unclear, we assume that the DEIS did not intent to present 16A and 16B subactions. The FEIS should clarify and may only wish to note that commercial trip limits of

0-2,400 pounds were considered by NMFS/Councils, but that 500 pounds is being proposed. Otherwise, options within the 0-2,400 pound range should be established and considered in the FEIS.

+ Option 1 for Action 16 (No Action) - We agree with the NMFS rejection of this option in order to cap commercial trip landings and prevent and minimize localized rapid reductions in abundance due to extended fishing effort or use of efficient gear.

* **Action 17 (No Size Limit for Wahoo)** - Since wahoo mature at a 45-inch FL, sexually immature specimens are frequently caught. This affects wahoo spawning potential and the size of subsequent year classes. Since recreational fishing can involve gaffing, the survival rate of discards is low. Accordingly, no size limit is proposed by NMFS/Councils.

EPA can agree with this approach if a recreational bag limit (as proposed in Action 18) and commercial trip limit (as proposed in Action 16) are promulgated since they should similarly serve to allow an adequate number of juveniles to become sexually mature and spawn. Other options might include use of larger lures that might be rejected by juveniles and releasing hooked juveniles without gaffing.

+ Option 1 for Action 17 (35 to 45-Inch FL Minimum Size for Wahoo) - EPA agrees with the NMFS rejection of this option since a bag limit and trip limit should serve to preserve a breeding population.

* **Action 18 (Wahoo Bag Limit of 2 Per Person Per Day)** - As discussed above, we conceptually agree with a wahoo bag limit and will defer to the expertise of the NMFS/Councils regarding the basis for the bag limit.

+ Option 1 for Action 18 (No Action) - We agree with the NMFS rejection of this option in order to prevent overfishing of adults and juveniles in order to protect the breeding population.

+ Option 2 for Action 18 (Bag Limit Exemption of For-Hire Captain & Crew) - We agree with the NMFS rejection of Option 2 to promote the intent of Action 18 and to prevent inconsistent bag limit regulations onboard for-hire vessels.

Action 19 (Allowable Gear for Dolphin and Wahoo) - We agree with regulating the gear type and efficiency as a form of fishery management.

+ Option 1 for Action 19 (No Action) - We agree with the NMFS rejection of this option in order to regulate the type of gear introduced into the fishery that may result in overfishing.

* **Action 20 (Prohibit Dolphin & Wahoo Long Lines in HMS Closed Areas)** - We strongly agree with this approach in order to be consistent with HMS FMP, facilitate management and enforcement, and prevent additional recreational/commercial fisher use conflicts.

+ Option 1 for Action 20 (No Action) - We agree with the NMFS rejection of this option in order to be consistent with the HMS FMP.

* **Action 21 (Fishing Year of Jan 1 to Dec 31)** - It is unclear as to why establishing a fishing year is proposed since fishing is to be allowed during the whole year with no time closures. Presumably, the intent is to establish the concept as a management tool which can be modified to include closures as needed through framework. As suggested on page 248, this action would initiate a benchmark for data collection and monitoring.

+ Option 1 for Action 21 (No Action) - We agree with the NMFS rejection of this option in order to establish this management tool.

Action 22A (EFH for Dolphin and Wahoo) - This action proposes to expand the Essential Fish Habitat (EFH) approved for dolphin to also apply to wahoo. Specifically, these EFHs include the Gulf Stream, Charleston Gyre, Florida Current and pelagic *Sargassum*. EPA supports the EFH concept and will defer to the expertise of the NMFS/Councils regarding their selection. We suggest that the FEIS further discuss the EFH as it relates to pelagic waters (as opposed to inshore waters) since no bottom habitat would be damaged through fishing gear or through most development. For example, how would the expansive and meandering Gulf Stream be protected as an EFH?

* **Action 22B (EFH-HAPCs for Dolphin and Wahoo)** - This action proposes to expand approved EFH-HAPCs (Habitat Areas of Particular Concern) for dolphin to apply to wahoo in the Atlantic. These EFH-HAPCs include the Ten-Fathom Ledge in North Carolina and The "Wall" off the Florida Keys. EPA also supports the EFH-HAPCs concept and will defer to the expertise of the NMFS/Councils regarding their designation. Additional discussion of these pelagic areas relative to the definition of EFH-HAPCs is requested.

+ Option 1 for Action 22 (No Action) - We agree with the NMFS rejection of this option in order to expand the designation of EFHs and EFH-HAPCs for dolphin and wahoo.

+ Option 2 for Action 22 (Expand EFH and EFH-HAPC to Include Sargassum) - This option would include *Sargassum* weed wherever it occurs in the Atlantic gyre. The NMFS has rejected Option 2 since *Sargassum* extends beyond U.S. EEZ waters where there is no federal jurisdiction.

While EPA does not disagree with this legal definition, the FEIS should consider a hybrid action that includes *Sargassum* in U.S. waters as an EFH-HAPC throughout the range of dolphin and wahoo, since the flotsam is used as open ocean "islands" for food and cover by these pelagic

species.

* ***Action 23 (Fishing Impacts on EFH)*** - Consistent with EPA NEPA review comments on the recent *Sargassum* FMP, we agree that *Sargassum* should not be harvested in order to protect this pelagic ecosystem which is used by dolphin and wahoo. If the *Sargassum* FMP is approved by NOAA, no additional action would seem to be needed. If not, we believe EFH protection of *Sargassum* communities would seem appropriate within the presently proposed FMP and should require the return to sea of any *Sargassum* unavoidably brought onboard during fishing. Dolphin and wahoo fishing in other proposed EFH-HAPCs would not seem to degrade these habitats since they are located in deep waters and fishing gear does not involve trawls or dredges that can damage benthic habitats.

+ ***Option 1 for Action 23 (No Action)*** - We agree with the NMFS rejection of this option in order to protect EFH-HAPCs for dolphin and wahoo against fishing impacts, particularly *Sargassum* communities and the harvesting of *Sargassum* weed.

+ ***Option 2 for Action 23 (Prohibit Harvest and Possession of Sargassum)*** - This option is unclear since it was rejected by NMFS yet it appears to support proposed Action 23. Page 263 states that Option 1 (no action) was rejected because “[n]ot prohibiting harvest of pelagic *Sargassum* in the South Atlantic EEZ would not meet objectives of the plan or the requirements of the Magnuson-Stevens related to essential fish habitat,” yet Option 2 was also rejected because “...NMFS disapproved prohibiting any harvest of pelagic *Sargassum* in their letter rejecting the original [*Sargassum*] FMP...” (pg. 265). The FEIS should discuss this apparent inconsistency and discuss the current NMFS position on the *Sargassum* fishery and the status of the *Sargassum* FMP. EPA supports the prohibition of *Sargassum* harvesting.

It is noted that Options 2 seems more consistent with the proposed Action 23 than an option to Action 23. The FEIS should revisit Option 2 and incorporate it into Action 23 or emphasize the difference between Option 2 and Action 23.

+ ***Option 3 for Action 23 (Prohibit Harvest and Possession of Sargassum With Exceptions)*** - This option would allow harvesting of *Sargassum* in specified areas. We agree with the NMFS rejection of this option. It is unclear however, if this option was rejected because some harvesting would be allowed in some areas, or if no harvesting would be allowed in some areas. The FEIS should discuss the position of the NMFS regarding *Sargassum* harvesting and protection of EFHs. Again, EPA supports the prohibition of *Sargassum* harvesting and also agrees with the Councils that “...any removal of pelagic *Sargassum* represents a net loss of EFH...” (pg. 269).

o Management Measures for U.S. Waters of the Caribbean

Action 24 (Natural Flotsom as EFH) - This action identifies natural objects such as

Sargassum weed, floating algae and other plants in the water column and their accumulation along ocean fronts as an EFH for dolphin and wahoo. However, it excludes manmade fish attracting devices (FADs) and lost nets. In principal, EPA does not disagree with the proposed action, but believes that FADs could be part of the EFH despite being manmade (we request that a hybrid option (or amending Action 24) that includes FADs be considered for the FEIS). However, lost nets and other manmade marine debris should not be included in the EFH definition in order to discourage marine disposal of refuse (despite the fact that such debris probably has flotsom value much like natural objects).

+ Option 1 for Action 24 (No Action) - We agree with the NMFS rejection of this option in order to establish EFHs for dolphin and wahoo.

+ Option 2 for Action 24 (Natural & Manmade Flotsom as EFH) - Option 2 defines the EFH as natural flotsom (*Sargassum*, algae, etc. in water column and along ocean fronts) and manmade items such as FADs, refuse and lost nets. We agree with the NMFS rejection of Option 2 because we believe refuse and lost nets should not be included as EFH. However, as indicated above, we believe FADs could be part of the EFH definition.

+ Option 3 for Action 24 (All Waters From Shoreline to EEZ as EFH) - This option encompasses all waters from the shoreline to the EEZ boundary as the EFH. We agree with the NMFS rejection of Option 3 since this area is too broad and difficult to enforce. It is also questionable if this entire area is truly *essential* habitat for dolphin and wahoo.

+ Option 4 for Action 24 (EFH as HAPC) - The NMFS rejected Option 4 to consider dolphin and wahoo HAPCs the same as EFHs since HAPCs are not yet defined for these species. We will defer to the NMFS/Councils for such designations but would expect that one or more HAPCs could be within an EFH, but would not be equated to an EFH.

+ Option 5 for Action 24 (Prohibit Fishing Impacts in EFH) - It is unclear how Option 5 differs from Action 23. The NMFS rejected Option 5 but proposes Action 23. The FEIS should clarify this apparent inconsistency.

+ Option 6 for Action 24 (Oppose Man-Induced Activities Potentially Harmful to EFH) - The NMFS rejected Option 6 in the sense that no such man-induced activities that are harmful to EFHs have been documented. Nevertheless, such activities could occur and should be opposed. Therefore, we suggest that this concept should proactively be included in Action 24 rather than rejected (unless this protection is already part of the definition of an EFH). The FEIS should consider.

+ Option 7 for Action 24 (Enhance Quality of EFH) - The NMFS rejected Option 7 in the sense that such issues should be addressed as they arise. As in the case of Option 6, we believe that this concept to support and enhance EFHs should be included in Action 24 rather than rejected (unless this is already part of the definition of an EFH). The

FEIS should consider.

o Management Measures for U.S. Waters of the Gulf of Mexico

* *Action 25 (Establish a Fishing Year of January 1 to December 31)* - This action for the Gulf EEZ would complement proposed Action 21 for the Atlantic EEZ. We agree with establishing a fishing year as a management tool (also see above EPA comments for Action 21).

+ *Option 1 for Action 25 (No Action)* - We agree with the NMFS rejection of this option (also see above EPA comments for Action 21).

+ *Option 2 for Action 25 (Other Fishing Years)* - Option 2 would establish a commercial fishing year from July 1 to June 30 and a recreational year from January 1 to December 31. Although rejected by the NMFS, it is unclear as to why Option 2 was rejected. The significance of the designated dates for the commercial fishery is also unclear. The FEIS should discuss.

* *Action 26 (Prohibit Sale of Recreational Dolphin)* - EPA agrees with this proposed action in the Gulf EEZ as discussed above for Action 11 in the Atlantic EEZ. We believe that recreational fishers should not be allowed to sell their catch in order to assure fish food quality. We further believe that for-hire vessels, even if they should hold a commercial permit, should also not be allowed to sell dolphin and wahoo unless fish quality can be assured.

+ *Option 1 for Action 26 (No Action)* - We agree with the NMFS rejection as discussed above for Action 11 for recreational vessels in order to help assure food quality standards and prevent double counting of fish landings as both recreational and commercial.

+ *Option 2 for Action 26 (Endorsement to Commercial King Mackerel Permit)* - Option 2 would require a commercial dolphin and wahoo endorsement to the commercial king mackerel permit to sell dolphin and wahoo. This option was rejected by the NMFS. We will defer to the NMFS.

+ *Option 3 for Action 26 (Prohibit Sale from all Vessels Without Commercial Permit)* - We agree with the NMFS rejection to promote food quality standards required for commercial fishers.

* *Action 27 (Fisher Allocation for Dolphin and Wahoo Based on 1984-1997 Landings)* - Action 27 would allocate dolphin (Action 27A) and wahoo (Action 27B) resources for recreational versus commercial fishing and would be based on an average of landings for 1984 to 1997. It is unclear as to why allocations in the Atlantic (Action 12 for dolphin) was based on significantly different baseline (1994-1997), unless this was an inadvertent typographical error (1984 vs. 1994). We agree with averaging of several years of landings but prefer that a more

recent data set be used as proposed for Action 12.

+ Option 1 for Action 27 (No Action) - We agree with the NMFS rejection of this option in order to establish a cap on commercial and recreational fishing consistent with historically distributed landings, but prefer the use of more recent data.

+ Option 2 for Action 27A (Allocate Dolphin Based on 1990-1997 or 1994-1997 Timeframes) - We disagree with the rejection of Option 2 since EPA prefer the use of 1994-1997 data set, which is also consistent with Action 12. However, from a NEPA standpoint, Option 2 is vague since it provides two timeframe options instead of one.

+ Option 3 for Action 27B (Allocate Wahoo Based on 1990-1997 or 1994-1997 Timeframes) - We disagree with the rejection of Option 3 since EPA prefer the use of 1994-1997 data set, which is also consistent with Action 12 for dolphin. However, from a NEPA standpoint, Option 3 is vague since it provides two timeframe options instead of one.

* **Action 28 (EFH)** - This proposed action discusses EFH under two actions, 28A and 28B. From a NEPA standpoint, Action 28A and 28B contradict each other and cannot both be proposed. Accordingly, Action 28B should probably have been an option to Action 28A, or vice-versa. The FEIS should consider.

Action 28A (EFH Based on Subhabitats & Conditions at Various Life Stages) - Action 28A proposes that the EFH be based on collected data that document conditions or subhabitats necessary to various life stages of dolphin and wahoo in the Gulf EEZ. We agree with such documentation if there is reason to believe that certain subhabitats that are not already part of the EFHs are critical to certain life stages of dolphin and wahoo. EPA will defer to the expertise of the NMFS/Councils.

Action 28B (EFH Without Subhabitats - Status Quo) - Action 28B does not propose documentation of subhabitats as EFH since they are not necessary, would not likely affect EFH, and there is uncertainty as to what constitutes EFH. We agree with such documentation if there is reason to believe that certain subhabitats that are not already part of the EFHs are critical to certain life stages of dolphin and wahoo. EPA will defer to the expertise of the NMFS/Councils.

+ Option 1 for Action 28 (No Action) - We agree with the NMFS rejection of this option since EFHs must be designated for each FMP.

+ Option 2 for Action 28 (EFH as All Waters Outside of 5 Fathoms Under Different Water Quality Conditions) - Option 2 proposes to identify the EFH as all waters outside of five fathoms as modified by natural conditions such as temperature, currents, salinity, etc. Option 2 was rejected by the NMFS since “a full identification of EFH for dolphin and wahoo is needed in order to fully understand the importance of individual components and to assess management strategies to maintain, protect, and improve EFH.” (pg. 294). This rationale is

unclear and should be clarified in the FEIS, i.e., it is unclear if such full identification is infeasible, unwarranted, not cost-effective, unavailable, etc. EPA believes that such identifications should be made and considered part of the EFH if there is reason to believe that conditions are critical to one or both species. If so, this option should not be rejected but rather incorporated, to the extent feasible, into Action 28.

+ Option 3 for Action 28 (EFH as Natural Flotsom Areas) - Option 3 was also rejected by NMFS using a rationale similar to Option 2. This rationale should be clarified in the FEIS. EPA believes that natural and possibly manmade structures (FADs) could be defined as EFH and should not be rejected but instead incorporated into Action 28 (see EPA above comments on Action 24).

+ Option 4 for Action 28 (Establish HAPCs) - Option 4 proposes to establish several HAPCs in the Gulf including Steamboat Lumps, the Flower Gardens, and DeSoto Canyon (pg. 295). This option was rejected by NMFS since "...HAPCs are not likely to provide additional protection..." We will defer to the expertise of the NMFS/Councils in this regard.

+ Option 5 for Action 28 (Prohibit Any Current Fishing Impacts on EFH) - Option 5 was rejected by NMFS since "...existing fishing activities are not known to negatively affect EFH..." (pg.297). It is further noted that no *Sargassum* fishery currently exists in the Gulf and that means to detect such fishing impacts have been established. As such, EPA agrees with the rejection of Option 5 as being duplicative.

+ Option 6 for Action 28 (Support and Enhance EFH) - Option 6 proposes to enhance dolphin and wahoo EFHs. The NMFS rejected this option since little is known about dolphin and wahoo habitat so enhancement is difficult at this time. EPA does not disagree, but favors inclusion of "enhancement" language in Action 28 (rather than rejection of the concept) which can be modified as habitat information becomes available and the framework process.



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October 12, 2001

Valerie L. Chambers
Chief, Domestic Fisheries Division
National Marine Fisheries Service, NOAA
1335 East-West Highway
Silver Spring, MD 20910

Dear Ms. Chambers:

Thank you for your letter of September 19, 2001, in which you provided for our review a copy of the Fishery Management Plan and the Draft Environmental Impact Statement for the Dolphin and Wahoo Fishery Management Plan submitted by the South Atlantic Fishery Management Council. As these documents do not contain an international component, we have no comment.

Sincerely,

A handwritten signature in dark ink, appearing to read "Bill Gibbons-Fly".

Bill Gibbons-Fly
Acting Director, Office of Marine Conservation



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

SEP 25 2001

In Reply Refer To:
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Valerie L. Chambers
Chief, Domestic Fisheries Division
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Silver Spring, MD 20910

Dear Ms. Chambers:

This is in regard to the request for the Department of the Interior's comments on the Draft Fishery Management Plan and Draft Environmental Impact Statement for the Dolphin and Wahoo Fishery of the Atlantic, Caribbean, and Gulf of Mexico.

This is to inform you that the Department may have comments, but will be unable to reply within the allotted time. Please consider this letter as a request for an extension of time in which to comment on the document.

Our comments, if any, should be available by late October 2001.

Sincerely,

Terence N. Martin

Terence N. Martin
Team Leader, Natural Resources Management
Office of Environmental Policy
and Compliance

Appendix J. ACCSP Release, Discard, and Protected Species Interactions Monitoring Program

**ATLANTIC COASTAL COOPERATIVE STATISTICS
PROGRAM (ACCSP)**

www.accsp.org

The ACCSP is a State-Federal cooperative initiative to improve the collection and management of Atlantic coast commercial, recreational, and for-hire fisheries data. The program began in November 1995 with the signing of a Memorandum of Understanding (MOU) by 23 Atlantic coast fisheries management agencies, signifying their intent to develop and implement this program.

The ACCSP Program Design, approved by the Coordinating Council on December 14, 1998, provides detailed information on ACCSP standards and policies, reporting requirements and sampling programs, quality control and assurance documentation, and processes necessary for adjustments and modification. This document should be followed by all ACCSP partner agencies as fully as possible to ensure effective implementation of the ACCSP data collection and data management models.

The Program Design document and subsequent module documents are all written in the future tense. This may result in some confusion about whether or not the program “is implemented” or “will be implemented at some point in the future”. The Program Design is the plan for a coast-wide data collection program. Minimum data elements that must be collected are identified, however, individual partners may collect additional data. It is up to the National Marine Fisheries Service and the other State/Federal Partners to implement this plan.

The Councils are adopting all approved modules, including the following Release/Discard & Protected Species Module, for the Dolphin Wahoo Fishery Management Plan (FMP). When the Secretary of Commerce approves the Dolphin Wahoo FMP, it will then be the responsibility of the NMFS (in cooperation with the other partner agencies) to implement the minimum data elements in the dolphin/wahoo fisheries.

Section 8. ACCSP Release, Discard, and Protected Species Interactions Monitoring Program

The ACCSP release, discard, and protected species interactions monitoring program will be a coastwide program (Maine through Florida) to include all living marine resources in estuarine, inshore, and offshore waters. Data should be collected from all U.S. fishing vessels leaving from and landing at east coast ports, including shore-based fishing operations. The program should be conducted throughout the year and will include commercial, recreational, and the for-hire fisheries.

The release, discard, and protected species interactions monitoring program will include quantitative and qualitative data collection components. The quantitative component includes an at-sea observer program and collection of release/discard data through the fishermen reporting system. The qualitative release, discard, and protected species interactions monitoring program will include sea turtle and marine mammal stranding networks and beach bird surveys, trend analysis, and add-ons to existing recreational and for-hire intercept and telephone surveys.

Release/discard data collected through the qualitative release/discard monitoring program and the fishermen reporting system will be used to identify and prioritize fisheries requiring collection of additional release, discard and gear configuration data through quantitative methods.

Reporting of protected species interactions and managed species data currently are the highest priorities under the ACCSP release, discard, and protected species interactions monitoring program. A Discard and Release Prioritization Committee will recommend priorities for the commercial, recreational, and the for-hire fisheries on an annual basis.

Required reporting of protected species interactions information is mandatory for the ACCSP commercial reporting system and is mandatory for the for-hire vessels which fall under the Marine Mammal Protection Act (MMPA) requirements. Reporting of protected species interactions is voluntary for recreational fishermen. Under federal statutes, incidental injury or mortality to a marine mammal during commercial fishing activities, including charter boat fisheries, must be reported within 48 hours of the end of a fishing trip, or for non-vessel fisheries, within 48 hours of occurrence.

Reporting of discards or releases through the catch and effort reporting system is strongly encouraged, although voluntary for non-protected discards or releases of other marine organisms. Any ACCSP partner may require mandatory reporting of any marine organism discard and release data, based on jurisdictional assessments or management requirements. All partners should develop outreach and fishermen training programs to improve reporting accuracy by fishermen. The ACCSP should evaluate the quality of the data and any voluntary, mandatory, and at-sea observer collection programs, at least annually.

Overview of the ACCSP release, discard, and protected species interactions monitoring program for commercial, for-hire, and recreational fisheries. See details on these programs in Sections 8.a through 8.c.

Figure 4. Overview of the ACCSP release, discard and protected species interactions monitoring program for commercial, for-hire, and recreational fisheries. See details on these programs in sections 8.a through 8.c.

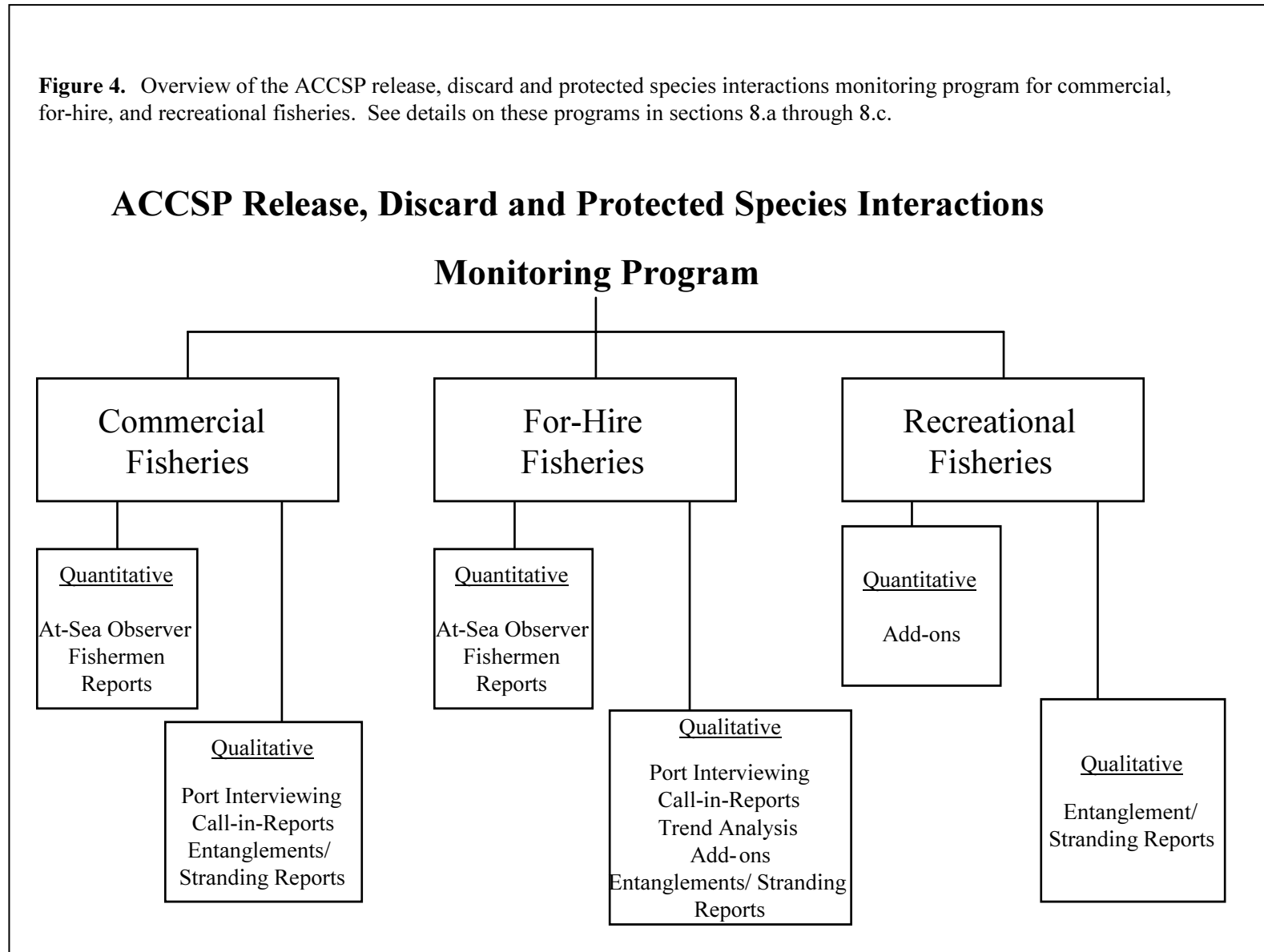
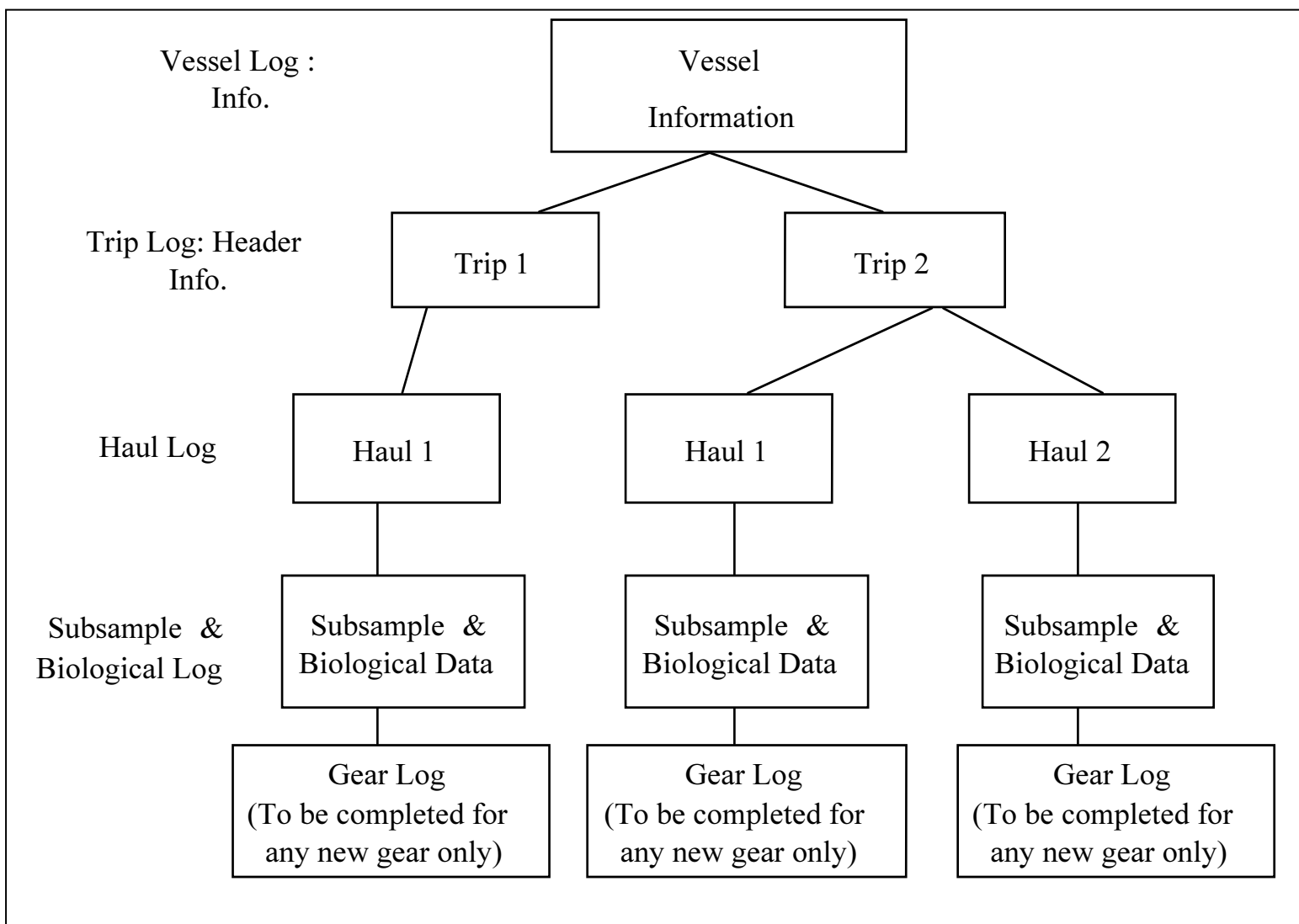


FIGURE 8.2. Flow of data collection forms for At-Sea Observer Program



Section 8.a Release, Discard, and Protected Species Interactions

The ACCSP quantitative release, discard, and protected species interactions monitoring program for commercial fisheries will include an at-sea observer program and commercial fishermen reporting.

The ACCSP qualitative release, discard, and protected species interactions monitoring program for commercial fisheries will include port interviewing to verify finfish reporting in the fishermen trip report and strandings and entanglements data.

Section 8.b. Release, Discard, and Protected Species Interactions Monitoring Program for the For-Hire Fisheries

The ACCSP quantitative release, discard, and protected species interactions monitoring program for the for-hire fisheries will include an at-sea observer program and fishermen reporting, through the appropriate methodology as determined by the Discard Prioritization Committee.

The ACCSP qualitative release, discard, and protected species interactions monitoring program for the for-hire fisheries will include port interviewing to verify finfish reporting in the fishermen logbook (if determined appropriate), call-in reporting, trend information provided through the fishermen trip report, and strandings and entanglements data, and an add-on to existing recreational telephone surveys for protected species data.

Development of sampling methodologies specific to collection of observer data from the for-hire fisheries will be accomplished once the catch/effort collection methodology has been determined for that mode.

Section 8.c. Release, Discard, and Protected Species Interactions Monitoring Program for Recreational Fisheries (Private/Rental and Shore Modes)

The ACCSP will continue to collect quantitative data on the number of released and discarded finfish species through existing recreational intercept surveys. The ACCSP will collect qualitative release/discard information on protected species for recreational fisheries (private/rental and shore modes) through an add-on to existing recreational telephone surveys, strandings, and entanglements data.

Section 8.d. Qualitative Release, Discard, and Protected Species Interactions Monitoring Program

The qualitative component of the release, discard, and protected species interactions monitoring program should include a combination of the following methods: 1) strandings and entanglements programs, 2) addition of questions and/or samples to existing recreational and for-hire telephone and intercept surveys, 3) commercial fisherman reporting systems, 4) port interviewing programs, and 5) real-time reporting programs.

Add-ons to existing recreational and for-hire surveys should be as follows: 1) additional questions added to telephone surveys for protected species interactions, and 2) additional sampling in the telephone and intercept surveys for finfish species in high incidence areas and/or the addition of special questions to both surveys.

For the purposes of this Module, entanglements are defined as a human interaction between marine species and fishing gear.

The National Stranding Network will serve as the ACCSP standard for the collection of strandings data. As the Stranding Network forms are modified, they should be reviewed by the Discard Prioritization Committee for inclusion in the Program Design.

Stranding and entanglement data collection programs should collect the approved minimum data elements listed in **Tables 8.E. and 8.F.** (pp. 8-26 to 8-37), including formats, descriptions, and reporting forms.

Stranding/entanglements data will include an assessment of human interaction: 1) physical contact between marine species and fishing gear (i.e., entanglements); 2) vessel/boat strikes; or 3) other human-related causes (e.g., ingestion of marine debris, gunshot). Strandings with evidence of an entanglement will be used to qualify interactions between commercial, for-hire, and recreational fisheries when possible.

Protected species interactions, releases, and discards of other marine organisms data collected through the commercial reporting system should be evaluated for trend information, especially for identification of high incidence areas for additional quantitative sampling.

Data collected through port interviewing programs should be used to verify data collected through real-time reporting and anecdotal information. Real-time reporting (i.e., 1-800 call-in systems) should be used for reporting of unusual events (interactions with protected species and possible finfish species).

The data collected through the ACCSP qualitative release, discard, and protected species interactions monitoring program will be used by the Discard, Prioritization Committee to prioritize and modify the quantitative release, discard, and protected species interactions data collection programs. The release/discard prioritization process should be linked closely with the setting of biological data collection priorities by the Biological Review Panel.

The ACCSP At-Sea Observer Program is mandatory for the for-hire vessels under the MMPA and vessels participating in commercial fisheries (dependent on their classification category under MMPA). As a condition of permitting, vessels should be required to carry at-sea observers.

Note: The ACCSP Coordinating Council approved the ACCSP observer program as mandatory, at Jekyll Island (October 19, 1998).

Specific fisheries priorities will be determined through the discard prioritization process to be developed by the Discard Prioritization Committee.

All ACCSP at-sea observer programs should be conducted following the sampling protocols in **Table 8.G.** (p. 8-38) The ACCSP At-Sea Observer Program should collect minimum standard data elements at the haul level for commercial fisheries and at the drop level (each time gear is set) in the for-hire fisheries, utilizing adopted ACCSP standards and quality control/assurance procedures. Data on gear configuration should be collected when major changes in gear are made during a trip. Please see **Tables 8.G - 8-S** (pp.8-38 to 8-83) for the reference tables and data elements associated with the quantitative observer program.

All ACCSP at-sea observer programs should be conducted under the overall program goals with regards to protected species interactions, releases, and discards of other marine organisms as follows. The Program should develop and document specific program objectives to meet these goals.

1. To quantify protected species interactions, releases, and discards of other marine organisms from all U.S. commercial and for-hire recreational fishing vessels leaving from or landing at east coast ports.
- 3 To obtain accurate and representative fisheries release/discard data that may be used for required state and federal programs that:
5. Support the goals and objectives of the Magnuson-Stevens Fishery Conservation and Management Act, Atlantic Coastal Fisheries Cooperative Management Act, Marine Mammal Protection Act, Endangered Species Act, Migratory Bird Treaty Act, Atlantic Striped Bass Conservation Act such as minimizing releases and discards, release and discard mortality, and for marine mammals, reducing interactions to insignificant levels approaching zero mortality;
6. identify and evaluate fishing gear and practices that minimize or eliminate protected species interactions, releases and discards of other marine organisms;
7. provide fishermen with fishing opportunities without impacting the objectives of fishery management plans for species that are fully exploited or overfished;
8. improve contributions to regional fishery management councils and the Atlantic States Marine Fisheries Commission (ASMFC) through a better understanding of the amount and nature of releases and discards, especially economic and regulatory releases and discards;

9. assess abundance of marine resources -- assessments used by the National Marine Fisheries Service, the councils, states, and ASMFC for development and amendment of fisheries regulations/management plans and for conservation and management of marine mammals and protected species; and
10. monitor the effectiveness of regulations, gear modifications, fishing practices, and fishery management plans in achieving conservation objectives.

To provide a verification tool for fishermen logbook reporting or other qualitative data collection methods;

4. To provide all state and federal fisheries agencies with a template for a comprehensive, long-term at-sea observer program, including standardized data elements and program design, sampling strategies, priorities, and data management; and,
5. To strengthen and verify the flow of information to fishery managers and scientists. The ACCSP and program partners will conduct an approved training program for all new at-sea observers, and will provide certification of qualifications through this program.

Non-verified observer data should be made available for data entry 1-7 days after the trip return date. Finalized data should be provided 45 days after the last day of the month for which data was collected.

The data collected through the ACCSP At-Sea Observer Program for commercial fisheries should be linked to the commercial fishermen reporting system by the unique identifier (trip start date, vessel/participant identifier, and trip number).

Given that longitude and latitude are collected at the haul level, it is not possible to provide this information at the trip level. Therefore, primary area fished will need to be determined by the observer after the completion of the trip. As recommended in **Table 8.H.** (p. 8-39), Area Fished is defined as the statistical area and distance from shore where most fishing occurs.

Pilot surveys will be conducted on a fishery-by-fishery basis to determine the appropriate level of observer coverage required to meet relevant management objectives.

Observer data vessel or individual identifiers will be disguised and the data will be aggregated before release from the ACCSP data management system. Authorized users will have access to individual identifiers. Non-authorized users requesting individual identifiers will be referred to the agency that originally collected the data.

NOTE: Under current NMFS rulings, observed data on a mandatory trip are not considered confidential since the data are observed by an agent of NMFS and not submitted by a reporting entity. Observed data on a voluntary trip is confidential.

Section 8.f. Annual Prioritization Process for the ACCSP Release, Discard, and Protected Species Interactions Monitoring Program

The ACCSP will utilize an annual prioritization process to determine fisheries to be targeted for observer coverage the following year. The process timeline will closely follow the ACCSP's Funding Decision Guidelines and the annual meeting of the ACCSP's Biological Review Panel. It is imperative that all Committee members attend these prioritization meetings. The prioritization process will be enhanced with diversity of opinion..

The evaluation matrix variables (**Table 8.A.**) will be utilized to prioritize Atlantic coast fisheries for observer coverage. Fisheries with the highest point totals after the evaluation should be considered high priority fisheries. The ACCESS fisheries database developed by ASMFC staff should be updated regularly and utilized to identify the fisheries to be evaluated in the matrix.

All available catch/effort data should be utilized to evaluate the Fishery Information variables. The ACCSP data management system should sum the number of records by gear/area strata to calculate the total number of trips.

Observer effort should be allocated across the fishing season for a particular species or group.

Table 8.A. Fishery Evaluation Matrix Variables

Fishery Information

Management Agency (for information only)

Total dollar value of the fishery (for information only)

Is the fishery managed? (national, regional, or inter-jurisdictional fishery management plan?)

Yes = 1

No = 0

Number of trips (general indication of the total number of trips from the prior year)

1 = 1 - 100

2 = 101 - 1000

3 = 1001 - 10,000

4 = 10,001 - 50,000

5 = 50,001 - 100,000

Total Landings (general indication of the total landings of that species by that gear type)

1 = < 33% of the total species landings

2 = > 34% but < 66% of the total species landings

3 = > 67% of the total species landings

Change in Prior Year's Landings

0 = < 50% change

3 = > 50% change

Discard Information

Amount of regulatory discards (dead) of target species (percent total weight of targeted species)

0 = none

1 = low (< 5%)

2 = medium (5-20%)

3 = high (> 20%), or unknown

Protected species interactions (general indication of protected species interactions in the targeted fishery) (MMPA Rating Scale)

0 = does not affect / no interactions

3 = low - interactions not likely to harm protected species stocks

6 = medium - interactions could affect or interactions are unknown but could affect recovery of protected species stocks

9 = high - interactions adversely affect recovery of protected species stocks

Table 8.A. (cont'd)

Amount of regulated species discards (general indication of the weight of discards of other regulated species, relative to total landings)

- 0 = none
- 1 = low < 5%
- 2 = medium 5-20%
- 3 = high > 20%, or unknown

Impact of discards on other regulated species stocks (general indication of the condition and biomass of the regulated species being discarded)

- 0 = no impact
- 1 = low
- 2 = medium
- 3 = high, or unknown

Amount of non-regulated species discards (general indication of the weight of discards of other non-regulated species, relative to total landings)

- 0 = none
- 1 = low < 5%
- 2 = medium 5-20%
- 3 = high > 20%, or unknown

Impact of discards on non-regulated species stocks (general indication of the condition and biomass of the non-regulated species being discarded)

- 0 = none
- 1 = low
- 2 = medium
- 3 = high, or unknown

Fishery							Species						
Fishery	\$ Value of Fishery	Management Agency ?	Fishery managed (y=1/n=0)	# Trips	Total Landings	Change in Prior Year's Landings or Effort	Regulatory discards of target species (dead)	Protected spp interaction	Amount of regulated spp discards	Impact of discards to other regulated spp stock	Amount of non-reg spp discards	Impact of discards on non-reg spp stock	Total points
	no	no											
	points	points;					0, 1, 2, 3	0, 3, 6, 9	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	
	info only	info only											
					1= <33%	0 = <50%	0 = none	0 = none	0 = none	0 = none	0 = none	0 = none	
					2= 34-66%	3 = > 50%	1 = < 5%	3 = low	1 = < 5%	1 = low	1 = < 5%	1 = low	
					3= >67%		2 = 5-20%	6 = med,	2 = 5-20%	2 = med	2 = 5-20%	2 = med	
				1-5 points			3 = > 20%	9 = high	3 = >20%	3 = high	3 = > 20%	3 = high	
							or unknown	or unknown	or unknown	or unknown	or unknown	or unknown	

The following target sampling levels are the ACCSP standards for the commercial fisheries portion of the Release, Discard, and Protected Species Interactions Monitoring Program:

A target of 5% of total trips, or achieving a 20-30% PSE for high priority fisheries.

A target of 2% of total trips for all other fisheries.

(in order to begin baseline data collection from non-priority fisheries)

These target sampling levels must be evaluated annually on a fishery by fishery basis to determine where the variance stabilizes and to meet desired goals.

Section 8.h. Recreational Fisheries Priorities

Recreational fisheries priorities should be compiled and evaluated as a portion of the ACCSP fishery prioritization process outlined in Section 8.f.

Until the ACCSP catch/effort and at-sea observer methodologies are determined, no observer targets be established for the for-hire fishery. However, finalization of the for-hire catch-effort protocols should not preclude a Partner proposing an observer pilot study for the for-hire sector.

Section 8.i. Observer Data Tracking System

The ACCSP will utilize a target tracking system, to track the number of observed trips so that observer effort may be reallocated as targets are met. ACCSP Partners should upload the following minimum data elements to the ACCSP tracking system before the 10th of the month following collection. The submission timeline will allow two effort reallocations per calendar quarter.

Partners are encouraged to monitor the tracking system as required to complete targets. The tracking system should reset to zero at the end of each quarter.

Table 8.B. Data Elements Required for the ACCSP Observer Tracking System

State Landed
Port Landed
Target Species (all three, if noted) (**Table 8.H.** p. 8-39)
Primary Area Fished
Primary Gear Used
Number of Protected Species Interactions

Section 8.j. Quality Assurance/Quality Control

Quality assurance/quality control standards for the Discard, Release, and Protected Species Interactions module may be found in **Appendix F-3** of the ACCSP Program Design.

Examples of per Sample Requirements and Annual Sample Targets
Requirements, per Sample, by Species, 2001

<u>SPECIES</u>	<u>LENGTHS</u>	<u>SCALES</u>	<u>OTOLITHS</u>
Alewife	100	20	--
Winter flounder	100	25	--
small	50	10	--
Black Sea Bass	100	25	
Blueback herring	100	--	20
Bluefish	100	25	--
Butterfish	100	--	25 or freeze 25+ fish
Cod Scrod	50	--	10
Market	100	--	20
Large or whale	100	--	20
Cusk	100	--	20
American plaice (dab)	100	--	25
small	50	10 or	10
Spiny dogfish	100 sexed	No age	
Summer flounder (fluke)	100	25	
small	50	10	
Witch flounder (grey sole)	100	--	25
small	50	10	
Haddock	100		50
Scrod (only)	50		25
Lobster	100 sexed	no age	
Mackerel	100		freeze 25+ fish
Monkfish	100	no age	
Ocean Quahog	30	no age	
Pollock	100		20
Redfish	100 sexed		10 male & 10 female
Red Crab	100 sexed	no age	
Rock Crab	100 sexed	no age	
Scup	100	25	
Surf Clams	30	no age	
Sea Herring			freeze 50+ fish
Sea Scallops	200	no age	
Shad	100	25	--
Shrimp	--	--	freeze 1 qt.
Silver hake	100	--	
Juvenile (only)	30	--	
Squid <i>Loligo</i>	100	--	
<i>Illex</i>	100	--	
Striped Bass	100	25	
Tilefish	100	--	20
Weakfish	100	25	--
White hake	100	--	25
Windowpane	100	25	--
Small	50	10	--
Yellowtail flounder	100 sexed	15 males & 15 females	--
Industrial Species	1-3 bushels	--	

BIOLOGICAL SAMPLING REQUIREMENTS by SPECIES/REGION - FY2000									
<i>Region</i>	<i>Species</i>	<i>Mkt Cat</i>	<i>Gear</i>	<i>Statistical Area</i>	<i>Oct-Dec</i>	<i>Jan-Mar</i>	<i>Apr-Jun</i>	<i>Jul-Sep</i>	<i>TOT</i>
ME	ATL HALIBUT	UNC	ALL	51	0	0	1	0	1
MA-N	ATL HALIBUT	UNC	ALL	51	0	0	1	0	1
				TOTAL	0	0	2	0	2
NJ	BLACK SEA BASS	JUMBO/LRG	ALL	6	1	1	2	0	4
RI	BLACK SEA BASS	JUMBO/LRG	OT	53-63	1	1	1	0	3
VA/MD	BLACK SEA BASS	JUMBO/LRG	ALL	62	0	0	2	2	4
VA/MD	BLACK SEA BASS	JUMBO/LRG	OT	61-63	0	4	2	0	6
NJ	BLACK SEA BASS	MED	ALL	6	1	1	2	0	4
RI	BLACK SEA BASS	MED	OT	53-63	1	1	1	0	3
VA/MD	BLACK SEA BASS	MED	ALL	62	0	0	2	2	4
VA/MD	BLACK SEA BASS	MED	OT	61-63	0	4	2	0	6
NJ	BLACK SEA BASS	SM	ALL	6	1	2	2	1	6
RI	BLACK SEA BASS	SM	OT	53-63	1	1	1	0	3

VA/MD	BLACK SEA BASS	SM	ALL	62	0	0	2	2	4
VA/MD	BLACK SEA BASS	SM	OT	61-63	0	4	2	0	6
				TOTAL	6	19	21	7	53
MA-S/CC	BLACKBACK	LMNSL	OT	522,56,525	1	1	1	1	4
MA-N	BLACKBACK	LRG	OT	51	2	1	2	1	6
MA-N	BLACKBACK	LRG	OT	522,56,525	0	1	1	0	2
MA-S/CC	BLACKBACK	LRG	OT	51	0	0	1	0	1
MA-S/CC	BLACKBACK	LRG	OT	521,526,53	1	1	1	2	5
MA-S/CC	BLACKBACK	LRG	OT	522,56,525	1	1	2	2	6
RI	BLACKBACK	LRG	OT	521,526,53,61	0	1	1	1	3
RI	BLACKBACK	LRG	OT	62,63	0	0	1	0	1
MA-N	BLACKBACK	MED	OT	51	0	1	0	0	1
MA-N	BLACKBACK	MED	OT	522,56,525	0	1	1	0	2
MA-S/CC	BLACKBACK	MED	OT	51	0	0	1	1	2
RI	BLACKBACK	MED	OT	521,526,53,61	0	1	2	1	4
RI	BLACKBACK	MED	OT	62,63	0	1	1	0	2
MA-S/CC	BLACKBACK	PW	OT	51	0	1	0	0	1
MA-S/CC	BLACKBACK	PW	OT	521,526,53	1	0	1	1	3
MA-S/CC	BLACKBACK	PW	OT	522,56,525	1	1	1	1	4
MA-S/CC	BLACKBACK	PW	OT	61-63	0	1	0	0	1
MA-S/CC	BLACKBACK	SM	OT	51	0	1	1	0	2
MA-S/CC	BLACKBACK	SM	OT	521,526,53	1	1	2	3	7
MA-S/CC	BLACKBACK	SM	OT	522,56,525	1	1	2	2	6
RI	BLACKBACK	SM	OT	521,526,53,61	0	0	1	1	2
MA-N	BLACKBACK	UNC	OT	522,56,525	0	1	1	0	2
NY/LI	BLACKBACK	UNC	OT	61-63	0	2	2	2	6
				TOTAL	9	19	26	19	73
MA-N	BLUEFISH	UNC	ALL	52,53	0	0	0	1	1

MA-S/CC	BLUEFISH	UNC	ALL	52,53	1	0	0	1	2
ME/NH	BLUEFISH	UNC	ALL	52,51	0	0	0	1	1
NJ	BLUEFISH	UNC	ALL	53,6	1	0	3	3	7
NY/LI	BLUEFISH	UNC	ALL	52,53,56,6	3	0	3	3	9
RI	BLUEFISH	UNC	ALL	52,53,56,6	1	0	0	1	2
VA/MD	BLUEFISH	UNC	ALL	6	2	0	1	1	4
				TOTAL	8	0	7	11	26
RI	BUTTERFISH	LRG	OT	52,53,56,6	2	2	0	0	4
RI	BUTTERFISH	MED	OT	52,53,56,6	1	1	0	0	2
RI	BUTTERFISH	SM	OT	52,53,56,6	2	2	0	0	4
NJ	BUTTERFISH	UNC	OT	53,6	1	1	1	1	4
NY/LI	BUTTERFISH	UNC	OT	51-53,6	0	1	0	0	1
RI	BUTTERFISH	UNC	OT	5	2	3	2	0	7
				TOTAL	8	10	3	1	22
MA-N	COD	LRG	GN	51	1	1	1	1	4
MA-N	COD	LRG	GN	52,53,56	1	1	1	1	4
MA-S/CC	COD	LRG	GN	51	1	1	1	1	4
ME/NH	COD	LRG	GN	51	1	1	1	1	4
ME/NH	COD	LRG	GN	52,53,56	1	1	1	1	4
MA-S/CC	COD	LRG	LL	51	1	1	1	1	4
MA-N	COD	LRG	OT	51	2	3	3	2	10
MA-N	COD	LRG	OT	52,53,56	2	2	2	2	8
MA-S/CC	COD	LRG	OT	52,53,56	2	2	3	2	9
ME/NH	COD	LRG	OT	51	1	1	1	1	4
ME/NH	COD	LRG	OT	52,53,56	1	1	2	1	5
MA-N	COD	MKT	GN	51	1	1	1	1	4
MA-N	COD	MKT	GN	52,53,56	2	2	2	2	8
MA-S/CC	COD	MKT	GN	51	1	1	1	1	4
ME/NH	COD	MKT	GN	51	1	1	1	1	4
ME/NH	COD	MKT	GN	52,53,56	1	2	2	2	7

MA-S/CC	COD	MKT	LL	51	1	1	1	1	4
MA-N	COD	MKT	OT	51	1	3	3	1	8
MA-N	COD	MKT	OT	52,53,56	2	2	3	3	10
MA-S/CC	COD	MKT	OT	52,53,56	2	2	4	3	11
ME/NH	COD	MKT	OT	51	1	1	1	1	4
ME/NH	COD	MKT	OT	52,53,56	2	2	2	2	8
MA-N	COD	SCROD	GN	51	1	1	1	1	4
MA-N	COD	SCROD	GN	52,53,56	1	1	1	1	4
MA-S/CC	COD	SCROD	GN	51	1	1	1	1	4
ME/NH	COD	SCROD	GN	51	0	0	1	1	2
ME/NH	COD	SCROD	GN	52,53,56	1	0	1	1	3
MA-S/CC	COD	SCROD	LL	51	1	1	1	1	4
MA-N	COD	SCROD	OT	51	2	2	1	1	6
MA-N	COD	SCROD	OT	52,53,56	2	2	2	3	9
MA-S/CC	COD	SCROD	OT	52,53,56	2	1	2	3	8
ME/NH	COD	SCROD	OT	51	1	1	1	1	4
ME/NH	COD	SCROD	OT	52,53,56	1	1	2	1	5
MA-S/CC	COD	UNC	GN	52,53,56	3	3	3	3	12
MA-S/CC	COD	UNC	LL	52,53,56	3	3	3	3	12
				TOTAL	48	50	58	53	209
MA-N	CUSK	UNC	OT	5	1	1	1	1	4
ME/NH	CUSK	UNC	OT	5	1	2	1	1	5
MA-N	CUSK	UNC	LL	5	1	1	1	1	4
ME/NH	CUSK	UNC	LL	5	1	1	1	1	4
				TOTAL	4	5	4	4	17
MA-N	DAB	LRG	OT	51,52,56	1	1	2	2	6
MA-S/CC	DAB	LRG	OT	52,53,56	0	0	1	1	2
ME/NH	DAB	LRG	OT	51,52,56	2	2	2	2	8
RI	DAB	LRG	ALL	5,6	0	0	1	0	1
MA-N	DAB	MED	OT	51,52,56	2	1	2	2	7

MA-S/CC	DAB	MED	OT	52,53,56	0	0	1	1	2
ME/NH	DAB	MED	OT	51,52,56	1	1	2	2	6
MA-N	DAB	SM	OT	51,52,56	2	2	2	1	7
MA-S/CC	DAB	SM	OT	52,53,56	1	2	2	1	6
ME/NH	DAB	SM	OT	51,52,56	1	1	2	2	6
				TOTAL	10	10	17	14	51
MA-N	DOGFISH	UNC	GN	51,52,56	0	0	2	2	4
MA-N	DOGFISH	UNC	OT	51,52	1	0	1	1	3
MA-N	DOGFISH	UNC	LL/LT	5,6	0	0	1	1	2
MA-S/CC	DOGFISH	UNC	GN	51,52,56	1	0	1	1	3
MA-S/CC	DOGFISH	UNC	LL/LT	5,6	2	0	2	2	6
ME/NH	DOGFISH	UNC	GN	51,52,56,6	2	2	2	2	8
ME/NH	DOGFISH	UNC	OT	51,52,56,6	2	2	2	2	8
VA/MD	DOGFISH	UNC	ALL	6	2	2	1	0	5
				TOTAL	10	6	12	11	39
MA-S/CC	FLUKE	JUMBO	OT	52,53,56,6	0	1	1	1	3
NJ	FLUKE	JUMBO	OT	53,6	1	2	1	1	5
NY/LI	FLUKE	JUMBO	OT	53,6	1	2	1	1	5
RI	FLUKE	JUMBO	OT	52,53,56,6	1	2	1	1	5
VA/MD	FLUKE	JUMBO	OT	62,63	2	4	1	1	8
MA-S/CC	FLUKE	LRG	OT	52,53,56,6	0	1	2	2	5
NJ	FLUKE	LRG	OT	53,6	1	4	1	2	8
NY/LI	FLUKE	LRG	OT	53,6	1	2	1	1	5
RI	FLUKE	LRG	OT	52,53,56,6	2	4	2	2	10
VA/MD	FLUKE	LRG	OT	53,6	3	6	1	1	11
MA-N	FLUKE	MED	OT	52,53,56,6	0	0	0	1	1
MA-S/CC	FLUKE	MED	OT	52,53,56,6	0	1	1	1	3
NJ	FLUKE	MED	OT	53,6	1	4	1	2	8
NY/LI	FLUKE	MED	OT	53,6	1	2	2	1	6
RI	FLUKE	MED	OT	52,53,56,6	2	4	2	2	10

VA/MD	FLUKE	MED	OT	53,6	3	6	1	1	11
NJ	FLUKE	SM	OT	53,6	1	1	1	1	4
NY/LI	FLUKE	SM	OT	53,6	1	1	1	1	4
RI	FLUKE	SM	OT	52,53,56,6	1	1	1	1	4
VA/MD	FLUKE	SM	OT	53,6	1	1	0	0	2
				TOTAL	23	49	22	24	118
MA-N	GOOSEFISH	LRG	ALL	5,6	1	4	3	1	9
MA-S/CC	GOOSEFISH	LRG	OT	5,6	6	8	6	4	24
MA-S/CC	GOOSEFISH	LRG	SD	5,6	7	3	5	6	21
ME/NH	GOOSEFISH	LRG	ALL	5,6	3	4	4	3	14
NJ	GOOSEFISH	LRG	GN	5,6	0	3	1	0	4
NJ	GOOSEFISH	LRG	SD	5,6	1	1	1	1	4
NY/LI	GOOSEFISH	LRG	GN	5,6	1	0	1	0	2
RI	GOOSEFISH	LRG	GN	5,6	1	0	1	0	2
RI	GOOSEFISH	LRG	OT	5,6	2	2	3	2	9
RI	GOOSEFISH	LRG	SD	5,6	0	0	0	1	1
VA/MD	GOOSEFISH	LRG	SD	5,6	0	1	2	1	4
MA-N	GOOSEFISH	PW	ALL	5,6	1	1	1	1	4
MA-S/CC	GOOSEFISH	PW	ALL	5,6	1	1	1	1	4
ME/NH	GOOSEFISH	PW	ALL	5,6	0	1	1	0	2
NJ	GOOSEFISH	PW	ALL	5,6	0	1	0	0	1
RI	GOOSEFISH	PW	ALL	5,6	1	1	1	1	4
VA/MD	GOOSEFISH	PW	ALL	5,6	0	1	1	1	3
MA-N	GOOSEFISH	SM	ALL	5,6	1	2	1	1	5
MA-S/CC	GOOSEFISH	SM	OT	5,6	8	10	8	4	30
MA-S/CC	GOOSEFISH	SM	SD	5,6	5	2	5	7	19
ME/NH	GOOSEFISH	SM	ALL	5,6	2	3	3	3	11
NJ	GOOSEFISH	SM	ALL	5,6	1	1	1	1	4
RI	GOOSEFISH	SM	OT	5,6	3	2	2	5	12
VA/MD	GOOSEFISH	SM	ALL	5,6	0	1	1	0	2
MA-N	GOOSEFISH	UNC	ALL	5,6	1	0	0	0	1

MA-S/CC	GOOSEFISH	UNC	ALL	5,6	1	0	1	0	2
NJ	GOOSEFISH	UNC	ALL	5,6	9	2	5	1	17
NJ	GOOSEFISH	UNC	ALL	5,6	9	2	5	1	17
NY/LI	GOOSEFISH	UNC	OT	5,6	1	1	1	0	3
NY/LI	GOOSEFISH	UNC	GN	5,6	1	0	2	0	3
VA/MD	GOOSEFISH	UNC	ALL	5,6	0	0	2	0	2
				TOTAL	67	58	69	46	240
MA-N	GREY SOLE	LRG	OT	51,52,56	1	1	1	1	4
MA-S/CC	GREY SOLE	LRG	OT	51,52,56	1	1	1	1	4
ME/NH	GREY SOLE	LRG	OT	51,52,56	3	3	3	3	12
MA-N	GREY SOLE	MED	OT	51,52,56	1	1	1	1	4
ME/NH	GREY SOLE	MED	OT	51,52,56	2	2	2	2	8
MA-N	GREY SOLE	SM/PW	OT	51,52,56	1	1	1	1	4
MA-S/CC	GREY SOLE	SM/PW	OT	51,52,56	1	1	1	1	4
ME/NH	GREY SOLE	SM/PW	OT	51,52,56	2	2	2	2	8
				TOTAL	12	12	12	12	48
MA-N	HADDOCK	LRG	OT	51	1	1	1	1	4
MA-N	HADDOCK	LRG	OT	52,56	2	1	2	1	6
MA-S/CC	HADDOCK	LRG	OT	52,56	2	2	2	2	8
ME/NH	HADDOCK	LRG	OT	51	1	1	1	1	4
ME/NH	HADDOCK	LRG	OT	52,56	1	1	1	1	4
RI	HADDOCK	LRG	OT	5,6	0	0	1	0	1
MA-N	HADDOCK	SCROD	OT	51	1	1	1	1	4
MA-N	HADDOCK	SCROD	OT	52,56	2	1	2	1	6
MA-S/CC	HADDOCK	SCROD	OT	52,56	2	2	2	2	8
ME/NH	HADDOCK	SCROD	OT	51	1	1	1	1	4
ME/NH	HADDOCK	SCROD	OT	52,56	1	1	1	1	4
RI	HADDOCK	SM	OT	5	0	0	1	0	1
				TOTAL	14	12	16	12	54

MA-N	HERRING	UNC	ALL	51,52,56	10	20	10	10	50
ME/NH	HERRING	UNC	OT	51	25	0	20	35	80
NJ	HERRING	UNC	ALL	6	0	5	0	0	5
RI	HERRING	UNC	ALL	5,6	0	15	0	0	15
				TOTAL	35	40	30	45	150
RI	<i>Illex</i>	FT	UNC	5,6	6	3	8	12	29
NJ	<i>Illex</i>	FT	UNC	62	6	4	6	9	25
NJ	<i>Illex</i>	FT	LG	61-63	0	0	4	6	10
VA/MD	<i>Illex</i>	OT	UNC	61-63	0	3	3	5	11
	<i>** See monthly sampling plan</i>				12	10	21	32	75
MA-N	LOBSTER	UNC	LP	52	1	0	1	1	3
MA-S/CC	LOBSTER	UNC	LP	5	3	2	4	4	13
ME/NH	LOBSTER	UNC	LP	515	1	1	1	1	4
RI	LOBSTER	UNC	LP	52,53,56,6	4	4	4	4	16
				TOTAL	9	7	10	10	36
MA-S/CC	<i>Loligo</i>	OT	UNC	5	0	0	2	0	2
MA-S/CC	<i>Loligo</i>	PN	UNC	5	0	0	5	2	7
RI	<i>Loligo</i>	OT	UNC	5,6	5	9	4	3	21
RI	<i>Loligo</i>	FT	UNC	5,6	6	11	5	4	26
NY/LI	<i>Loligo</i>	OT	UNC	5,6	3	3	3	6	15
NJ	<i>Loligo</i>	OT	UNC	6	9	12	5	2	28
VA/MD	<i>Loligo</i>	OT	UNC	6	0	1	0	0	1
	<i>** See monthly sampling plan</i>				23	36	24	17	100
ME/NH	MACKEREL	UNC	OT	51	0	1	1	0	2
NJ	MACKEREL	UNC	OT	5,6	4	4	4	0	12
RI	MACKEREL	UNC	OT	5,6	4	4	4	0	12
VA/MD	MACKEREL	UNC	OT	5,6	0	1	0	0	1
				TOTAL	8	10	9	0	27

MA-S/CC	OCEAN POUT	UNC	OT	51,52,53	0	2	2	0	4
RI	OCEAN POUT	UNC	OT	52,53,6	0	2	2	0	4
NY/LI	OCEAN POUT	UNC	OT	53,6	0	3	3	0	6
				TOTAL	0	7	7	0	14
MA-S/CC	OCEAN QUAHOG	UNC	CD	53,61	7	7	7	7	28
ME/NH	OCEAN QUAHOG	UNC	CD	51	5	5	5	5	20
NJ	OCEAN QUAHOG	UNC	CD	61,62	5	10	10	10	35
NY/LI	OCEAN QUAHOG	UNC	CD	53, 61	5	5	5	5	20
RI	OCEAN QUAHOG	UNC	CD	52,53,56	10	10	8	8	36
VA/MD	OCEAN QUAHOG	UNC	CD	62,63	5	5	5	5	20
				TOTAL	37	42	40	40	159
NJ	OFFSHORE HAKE	UNC	OT	53,61	0	0	1	0	1
RI	OFFSHORE HAKE	UNC	OT	53,61	0	0	1	0	1
				TOTAL	0	0	2	0	2
MA-N	POLLOCK	LRG	GN	51,52,56	1	1	1	1	4
MA-N	POLLOCK	LRG	OT	51,52,56	3	3	3	3	12
ME/NH	POLLOCK	LRG	GN	51,52,56	2	2	2	2	8
ME/NH	POLLOCK	LRG	OT	51,52,56	2	2	2	2	8
MA-N	POLLOCK	MED	OT	51,52,56	2	2	2	2	8
ME/NH	POLLOCK	MED	GN	51,52,56	2	2	2	2	8
ME/NH	POLLOCK	SM	GN	51,52,56	2	2	2	2	8
ME/NH	POLLOCK	SM	OT	51,52,56	2	2	2	2	8
				TOTAL	16	16	16	16	64
MA-N	RED HAKE	UNC	OT	51,52,56	1	0	1	1	3
NJ	RED HAKE	UNC	OT	52,53,56,6	1	1	1	1	4

NY/LI	RED HAKE	UNC	OT	52,53,56,6	3	3	1	1	8
RI	RED HAKE	UNC	OT	52,53,56,6	1	1	2	1	5
				TOTAL	6	5	5	4	20
MA-N	REDFISH	UNC	OT	51,52,56	2	2	2	2	8
ME/NH	REDFISH	UNC	OT	51,52,56	1	1	2	1	5
				TOTAL	3	3	4	3	13
MA-S/CC	SCUP	JUM	ALL	52,53,56	0	0	1	1	2
NJ	SCUP	JUM	ALL	6	0	2	0	0	2
RI	SCUP	JUM	ALL	53,6	0	0	1	1	2
MA-S/CC	SCUP	LRG	ALL	52,53,56	1	0	1	1	3
NJ	SCUP	LRG	OT	53,6	1	4	1	1	7
NY/LI	SCUP	LRG	ALL	53,6	1	1	1	0	3
RI	SCUP	LRG	ALL	52,53,56,6	2	1	1	1	5
VA/MD	SCUP	LRG	OT	6	0	1	0	0	1
NJ	SCUP	LRG MIX	OT	52,53,6	0	2	0	0	2
MA-S/CC	SCUP	MED	ALL	52,53,56	1	0	1	1	3
NJ	SCUP	MED	OT	53,6	0	1	1	0	2
NY/LI	SCUP	MED	ALL	53,6	1	1	1	0	3
RI	SCUP	MED	ALL	52,53,56,6	2	1	1	1	5
VA/MD	SCUP	MED	OT	6	0	1	0	0	1
NJ	SCUP	PIN	ALL	6	0	1	0	0	1
NY/LI	SCUP	PIN	ALL	6	1	0	0	0	1
MA-S/CC	SCUP	SM	ALL	52,53,56	1	0	0	0	1
NJ	SCUP	SM	OT	53,6	1	1	1	1	4
NY/LI	SCUP	SM	ALL	53,6	1	0	0	0	1
RI	SCUP	SM	OT	52,53,56,6	1	1	1	1	4
VA/MD	SCUP	SM	OT	6	0	1	1	0	2
NY/LI	SCUP	UNC	ALL	53,6	2	1	1	1	5
				TOTAL	16	20	14	10	60

MA-N	SEA SCALLOP	UNC	SD	ANY	0	0	1	1	2
MA-S/CC	SEA SCALLOP	UNC	SD	5	9	10	28	21	68
MA-S/CC	SEA SCALLOP	UNC	SD	6	5	7	19	13	44
ME/NH	SEA SCALLOP	UNC	SD	ANY	9	7	1	0	17
NJ	SEA SCALLOP	UNC	SD	ANY	3	6	17	11	37
RI	SEA SCALLOP	UNC	SD	ANY	0	0	0	1	1
VA/MD	SEA SCALLOP	UNC	SD	ANY	6	13	29	19	67
VA/MD	SEA SCALLOP	UNC	TRA WL	ANY	1	3	7	5	16
				TOTAL	33	46	102	71	252
MA-N	SHRIMP	UNC	OT	51	0	4	2	0	6
ME/NH	SHRIMP	UNC	OT	51	0	16	6	0	22
				TOTAL	0	20	8	0	28
NJ	SILVER HAKE	JUV	OT	ANY	2	2	2	2	8
NY/LI	SILVER HAKE	JUV	OT	ANY	8	8	6	6	28
RI	SILVER HAKE	JUV	OT	ANY	2	3	4	2	11
MA-N	SILVER HAKE	UNC	OT	5	4	1	1	4	10
MA-S/CC	SILVER HAKE	UNC	OT	5	4	1	1	4	10
NJ	SILVER HAKE	UNC	OT	6	2	3	3	2	10
NY/LI	SILVER HAKE	UNC	OT	52,53,6	10	14	8	8	40
RI	SILVER HAKE	UNC	OT	52	5	3	2	0	10
RI	SILVER HAKE	UNC	OT	53,6	3	5	10	0	18
				TOTAL	40	40	37	28	145
NJ	SURFCLAM	UNC	CD	6	10	10	10	10	40
NY/LI	SURFCLAM	UNC	CD	61,53	10	10	10	10	40
VA/MD	SURFCLAM	UNC	CD	6	10	10	10	10	40
				TOTAL	30	30	30	30	120
ME/NH	TILEFISH	LRG	LL	52-63	0	1	1	0	2

NJ	TILEFISH	LRG	LL	52-63	0	2	2	0	4
NY/LI	TILEFISH	LRG	LL	52-63	1	1	1	1	4
ME/NH	TILEFISH	MED	LL	52-63	0	1	1	0	2
RI	TILEFISH	MED	ALL	52-63	1	0	1	1	3
NY/LI	TILEFISH	MED	LL	52-63	3	3	2	2	10
NJ	TILEFISH	MED	LL	52-63	0	2	2	0	4
RI	TILEFISH	SM/KIT	ALL	52-63	1	1	0	0	2
NY/LI	TILEFISH	SM/KIT	LL	52-63	3	2	1	1	7
NJ	TILEFISH	SM/KIT	LL	52-63	1	1	1	0	3
				TOTAL	10	14	12	5	41
MA-N	WHITE HAKE	LRG	GN	5	1	1	1	1	4
MA-N	WHITE HAKE	LRG	OT	51,52,56	1	1	1	1	4
MA-N	WHITE HAKE	LRG	OT	52,53,56	1	1	1	1	4
ME/NH	WHITE HAKE	LRG	GN	51,52,56	1	1	2	2	6
ME/NH	WHITE HAKE	LRG	LL/LT	5,6	1	1	1	1	4
ME/NH	WHITE HAKE	LRG	OT	5	2	1	1	3	7
ME/NH	WHITE HAKE	LRG	OT	51,52,6	1	1	1	1	4
MA-N	WHITE HAKE	MED	OT	52,53,56	1	1	2	2	6
ME/NH	WHITE HAKE	MED	GN	5	1	1	2	2	6
ME/NH	WHITE HAKE	MED	LL/LT	5	1	1	1	1	4
ME/NH	WHITE HAKE	MED	OT	5	1	1	1	1	4
MA-N	WHITE HAKE	SM	OT	51,52,56	1	1	1	1	4
MA-N	WHITE HAKE	SM	OT	52,53,56	1	1	1	1	4
ME/NH	WHITE HAKE	SM	GN	51,52,56	1	1	1	1	4
ME/NH	WHITE HAKE	SM	OT	5	1	1	1	1	4
MA-S/CC	WHITE HAKE	UNC	OT	5	1	1	1	1	4
ME/NH	WHITE HAKE	UNC	LL/LT	5	1	1	1	1	4
ME/NH	WHITE HAKE	UNC	OT	5	1	1	1	1	4
				TOTAL	19	18	21	23	81
MA-S/CC	WINDOWPANE	UNC	OT	52,56	5	4	3	5	17

NY/LI	WINDOWPANE	UNC	OT	53,61	2	1	1	1	5
RI	WINDOWPANE	UNC	OT	52,53,61	2	0	0	0	2
				TOTAL	9	5	4	6	24
MA-N	YELLOWTAIL	LRG	OT	514,521	2	2	2	2	8
MA-S/CC	YELLOWTAIL	LRG	OT	514,521	2	2	2	2	8
MA-S/CC	YELLOWTAIL	LRG	OT	522,56,525	2	2	2	2	8
MA-S/CC	YELLOWTAIL	LRG	OT	526,53	2	2	2	2	8
RI	YELLOWTAIL	LRG	OT	526,537,539	2	2	2	2	8
RI	YELLOWTAIL	LRG	OT	522,525,56	2	2	2	2	8
RI	YELLOWTAIL	LRG	OT	526,53	2	2	2	2	8
MA-N	YELLOWTAIL	SM	OT	514,521	2	2	2	2	8
MA-S/CC	YELLOWTAIL	SM	OT	514,521	2	2	2	2	8
MA-S/CC	YELLOWTAIL	SM	OT	522,56,525	2	2	2	2	8
MA-S/CC	YELLOWTAIL	SM	OT	526,53	2	2	2	2	8
RI	YELLOWTAIL	SM	OT	526,537,539	2	2	2	2	8
RI	YELLOWTAIL	SM	OT	522,525,56	2	2	2	2	8
RI	YELLOWTAIL	SM	OT	526,53	2	2	2	2	8
				TOTAL	28	28	28	28	112
				OVERALL TOTAL	553	647	693	582	2475

Samplers should attempt to obtain at least 30 length frequencies of a single species/market category, but no more than 50, from each sampled trip.

Please Note: Non-rounded target numbers are a three-year average of lengths or biological samples taken for that species from that state. Rounded target numbers are state-apportioned portions of the entire South Atlantic target.

SPECIES	STATE	Lengths	Otoliths	Gonads
Black Grouper	FL	1200		960
		GA		
		NC	3	
		SC	21	
Black Sea Bass	FL	136	34	
		GA	600	240
		NC	1200	480
		SC	600	240
Gag Grouper	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240
Golden Tilefish	FL	1200	480	
		GA	1200	480
		NC	79	
		SC	1200	480
Grey Snapper	FL	1200	960	1200
		GA	7	
		NC	1	
		SC	16	
Gray Triggerfish	FL	1200	480	
		GA	600	240
		NC	600	240
		SC	600	240
Greater Amberjack	FL	1200	480	1200
		GA	600	240
		NC	600	240
		SC	600	240
Hogfish	FL		1200	7
		GA		
		NC	36	
		SC	241	

SPECIES	STATE	Lengths	Otoliths	Gonads
Jolthead Porgy	FL	600	240	600
		GA		
		NC	6	
		SC		
King Mackerel	FL	1800	804	
		GA	15	
		NC	900	
		SC	900	204
Spanish Mackerel	FL	1404	1080	
		GA	60	
		NC	696	
		SC	1	60
Lane Snapper	FL	1200	960	
		GA		
		NC		
		SC	2	
Lesser Amberjack	FL	960		
		GA	480	
		NC	480	
		SC	480	
Littlehead Porgy	FL	600	240	600
		GA		
		NC		
		SC		
Margate	FL	600	240	600
		GA		
		NC	6	
		SC		
Mutton Snapper	FL	1800	1440	1800
		GA	7	
		NC	6	
		SC	18	
Red Porgy	FL	600	52	
		GA	600	240
		NC	600	240
		SC	600	240
Red Snapper	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240

SPECIES	STATE	Lengths	Otoliths	Gonads
Scamp		FL	600	43
		GA	600	240
		NC	600	240
		SC	600	240
Snowy Grouper	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240
Vermilion Snapper	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240
White Grunt	FL	600	240	
		GA	600	240
		NC	600	240
		SC	600	240
Wreckfish	FL	1200	480	
		GA	1200	480
		NC		
		SC	1200	480
Yellowtail Snapper	FL	2400	960	
		GA	13	
		NC	4	
		SC	10	

NO TARGETS IDENTIFIED FOR THESE SPECIES -

2000-2001

Tautog
Atlantic sturgeon
Atlantic croaker
Red drum
American eel
Horseshoe crab
Northern shrimp
Atlantic menhaden
River herring/Hickory shad
Spot
Spotted seatrout
Winter flounder
Spiny dogfish

Table 8.D. Overview of the ACCSP qualitative release, discard, and protected species interactions monitoring program.

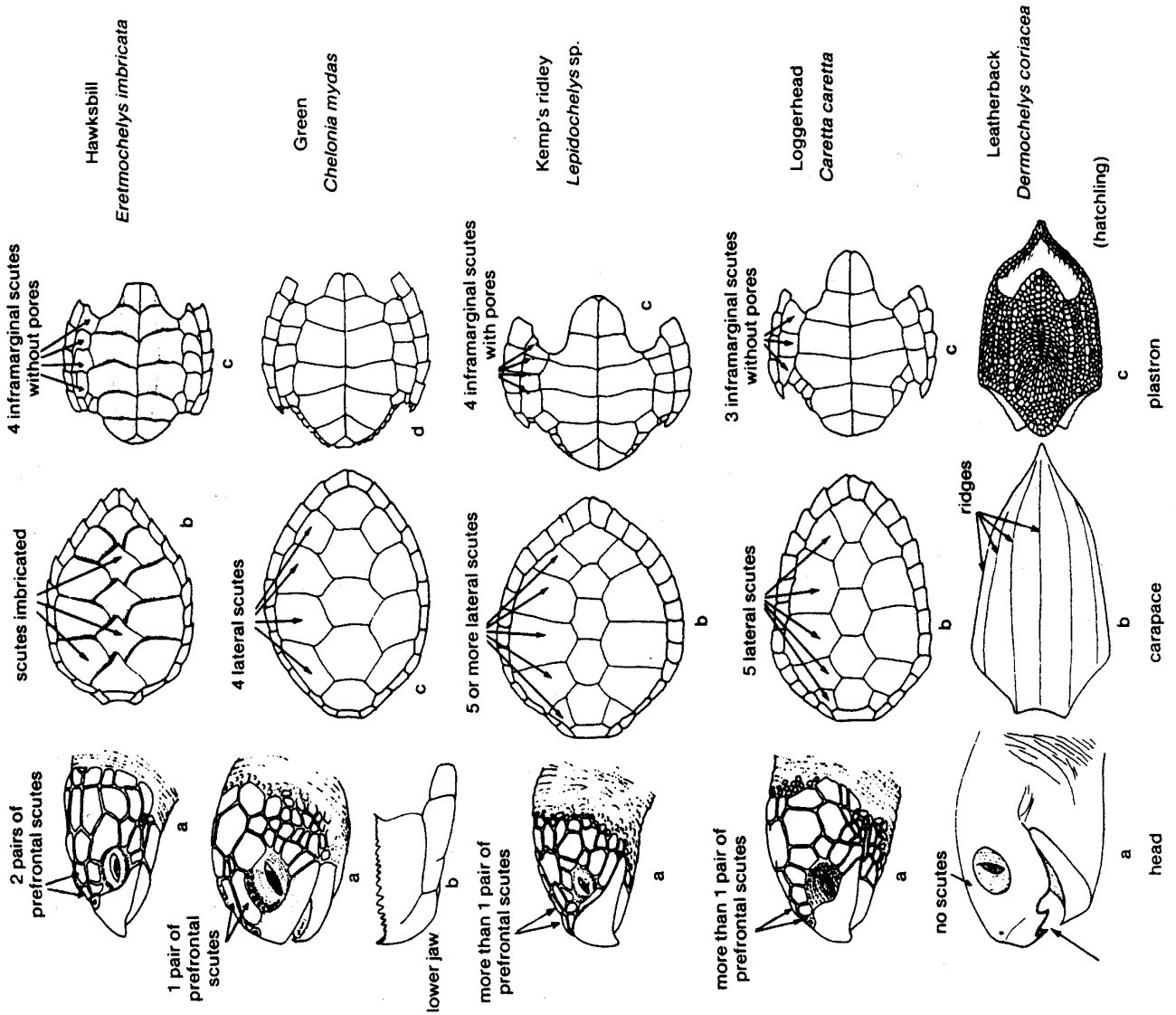
Program Activity	Description / Criteria
Stranding/Entanglement Programs	<ul style="list-style-type: none"> 11. Use existing infrastructure and framework, including standard forms. 12. Provide funding to implement procedures for a coordinated coastwide stranding/entanglement network. 13. Provide stranding/entanglement data to the ACCSP. 14. Gear taken from stranding/entanglement programs should be retained and stored for future analysis.
Add-on to Existing Recreational and for-hire Telephone and Intercept Surveys	<ul style="list-style-type: none"> 15. Continue collection of release/discard data through existing catch surveys for recreational and for-hire fisheries. 16. Increase sample size in areas of high incidence of releases and discards. 17. Add additional questions to the telephone and intercept surveys for protected species interactions.
Commercial Reporting System	<ul style="list-style-type: none"> 18. Evaluate release/discard data collected through commercial catch/effort data collection programs for trend information to identify release/discard problem areas. 19. If for-hire logbooks are implemented through the ACCSP, evaluate release/discard data for trend information.
Port Interviewing	<ul style="list-style-type: none"> 20. Use of interview data from port interviewing programs to verify information collected through real-time reporting and other anecdotal information. 21. Use port interviewing programs for dissemination of ACCSP information and materials. 22. Data elements should include time, area, date, fishery type, release/discard information.
Real-Time Reporting	<ul style="list-style-type: none"> 23. 1-800 call-in system for real-time reporting of rescue needs or unusual event taking of protected species and possible finfish species. The system should accept anonymous information. 24. Data to be collected should include area, date, time, fishery type (if applicable), releases, and discards. 25. One number should be provided and maintained by one ACCSP program partner. 26. All relevant information should be forwarded in a timely manner to the appropriate organization/office for action. 27. Verification of reports should be made through port interviewing, the commercial fishermen logbook reporting system, U.S. Coast Guard boardings, and the at-sea observer program.

Table 8.E. Minimum standard data elements to be collected through the sea turtle strandings and salvage network for providing information to the ACCSP qualitative release, discard, and protected species interactions data collection program.

Data Element	Description / Criteria	Format
Observer Name	Initials of the person who handled the turtle in the field.	3 digit character
Stranding Date	The date the turtle was first reported or encountered.	MM:DD:YYYY
Observer Address/Affiliation	Address where observer can be reached.	50 digit character
Observer Phone Number	Phone number, including area code, where observer can be reached.	10 digit numeric
Species	The species of sea turtle observed. (NOTE: Committee recommends addition of an ITIS Unknown Turtle Species code and delete Reliability of ID field below)	ITIS 11 digit character (Table A.8 Program Design)
Turtle Number By Day	Sequential number indicating the number of turtles observed during each day. This data element will default to one when only one turtle was observed.	2 digit numeric
Indication of Verification of Identification	Indication of whether the species identification was verified by a state coordinator (0=no, 1=yes).	1 digit character
Sex	Sex of the sea turtle (1=male, 2=female, 9=undetermined).	1 digit character
Sex Determined	Indication of how sex was determined (1=necropsy; 2=tail length beyond carapace in adults)	1 digit numeric
State	The state in which the sea turtle was stranded.	2 digit character postal alpha abbreviation (Table A.3, Program Design)
County	The county in which the sea turtle was stranded.	3 digit character FIPS code (Table A.9 Program Design)
Latitude	The specific latitude of the stranding. If latitude cannot be provided specific reference information should be provided on the stranding location in the Notes field.	6 digit numeric, 2 decimal minutes

Data Element	Description / Criteria	Format
Longitude	The specific longitude of the stranding. If longitude cannot be provided specific reference information should be provided on the stranding location in the Notes field.	7 digit numeric, 2 decimal minutes
Condition	An indication of the general condition of the turtle (0=alive, 1=fresh dead, 2=moderately decomposed, 3=severely decomposed, 4=dried carcass, 5=skeletons/bones only).	1 digit numeric
Final Disposition	The final disposition in which the observer left the turtle (1=painted, left on beach; 2= buried, on beach/off beach; 3=salvaged specimen, all/part; 4=pulled up on beach or dune; 5=unpainted, left on beach; 6=released alive, 7=taken alive to holding facility, 9=unknown).	1 digit numeric
Tag Numbers	List of tag numbers and indication of location of tag.	12 digit character
Carapace Length	Length of the carapace over curve.	5 digit numeric
Length Type	Straight length - SCL Curve length - CLL	3 digit character
Units of Measurement (Carapace Length and Width)	Units of length measurement (CM=centimeters, IN=inches).	2 digit character (Table A.3 Program Design)
Carapace Width	Width of the carapace over curve (curved length).	5 digit numeric
Width Method	Straight width - SCW Curve width - CLW	3 digit character
Weight	Weight of turtle	5 digit numeric
Units of Measurement (Weight)	Units of weight measurement (KG=kilograms, LB=pounds).	2 digit character (Table A.3 Program Design)
Notes	General remarks of the observer (i.e., whether turtle was involved with tar or oil, gear or debris entanglement, wounds or mutilations, propeller damage, papillomas, epizoa).	See Table A.12 Program Design, for note codes.

PICTURE GUIDE TO SPECIES OCCURRING IN THE AREA



BACK OF FORM

Minimum standard data elements to be collected through the marine mammal stranding network providing information to the ACCSP qualitative release, discard, and protected species interactions monitoring program.

Data Element	Description / Criteria	Format
Field Number	Assigned by responding organization - used to identify individual stranded animals.	Character
NMFS Registration Number	Assigned by NMFS. Used to identify individual stranded animals.	Character
National Database Number	Assigned by NMFS. Used to identify individual stranded animals.	Character
Common Name	The common name of the marine mammal observed.	25 digit character
Species	The species of the marine mammal observed.	ITIS11 digit character (Table A.8 Program Design)
Observer Name	Initials of the person who handled the marine mammal in the field.	3 digit character
Observer Affiliation	Agency/group observer is associated with.	50 digit character
Observer Address	Address where observer can be reached.	50 digit character
Observer Phone Number	Phone number, including area code, where observer can be reached.	10 digit numeric
Sighting Only	0 = No 1 = Yes - note if a sighting only	1 digit character
Location Found	1 = beach 2 = floating 3 - swimming 4 = other	1 digit character
State	The state in which the marine mammal was observed.	2 digit character FIPS (postal code) (Table A.9, Program Design)
County	The county in which the marine mammal was observed.	3 digit character FIPS (Table A.9, Program Design)
City	The city in which the marine mammal was observed.	10 digit character
Locality Details	Details on the specific locality where the marine mammal was observed.	50 digit character
Latitude	The specific latitude of the marine mammal observation.	6 digit numeric, 2 decimal minutes
Longitude	The specific longitude of the marine mammal observation.	7 digit numeric, 2 decimal minutes
Mass Stranding	Indication of whether the observation was a mass stranding of marine mammals (0=no, 1=yes).	1 digit numeric

Table 8.F. (cont'd)		
Data Element	Description / Criteria	Format
Number of Animals	# of animals involved in the stranding event	3 digit numeric
Human Interaction	Indication of whether a human interaction occurred (0=no, 1=yes, 2= cannot be determined).	1 digit numeric
Type of Human Interaction	Type of human interaction, if applicable (1=boat collision, 2=shot, 3=fishery interaction, 4=other).	1 digit numeric
Determination of Human Interaction	1 = external exam, 2 = internal exam, 3 = not examined	3 digit character
Other Causes	0 = no, 1 = yes, 2 = CTBD	1 digit character
Description of Other Causes	Circumstances surrounding the stranding other than, or in addition to, evidence of human interaction.	50 digit character
Date of Initial Observation	Initial observation date of the marine mammal.	MM:DD:YYYY
Condition at Initial Observation	An indication of the general condition of the marine mammal at the initial observation (1=alive, 2=fresh dead, 3=moderately decomposed, 4=advanced decomposition, 5=mummified, 9=unknown).	1 digit numeric
Date of Examination	Date of examination of the marine mammal.	MM:DD:YYYY
Status	1 = alive, 2 = dead, 3 = unknown	1 digit character
Condition at Examination	An indication of the general condition of the marine mammal at the time of examination (1=alive, 2=fresh dead, 3=moderately decomposed, 4=advanced decomposition, 5=mummified/skeletal, 9=dead/unknown).	1 digit numeric
Live Animal Condition/Disposition	The final disposition of the marine mammal (1=left at site, 2=immediate release at site, 3=relocated, 4=euthanized at site, 5=died at site, 6=transferred to rehabilitation, 7=died during transport).	1 digit numeric
Transport	Information on where the marine mammal was transported to.	25 digit character

Table 8.F. (cont'd)		
Data Element	Description / Criteria	Format
Final Disposition After Transport	Indication of whether the mammal died or was released during or after transport (0=died, 1=released)	1 digit numeric
Date of Final Disposition	Date that marine mammal died or was released on or after transport.	MM:DD:YYYY
Tag(s) Applied	Were tags applied/attached to marine mammal, for identification (0=no, 1=yes)	1 digit character
Tag(s) Present	Were tags present on the marine mammal upon initial identification (0=no, 1=yes)	1 digit character
Tag Number(s) and Description	List tag number(s), description of tag type(s), and tag location(s).	50 digit character
Tag Placement	Location where tag was placed (1=front, 2=rear).	1 digit numeric
Carcass Disposition	The disposition of the carcass (1=left at site, 2=buried, 3=towed, 4=scientific collection, 5=educational collection, 6=other, 9=unknown).	1 digit numeric
Necropsy	Indication of whether the marine mammal was necropsied (0=no, 1=yes).	1 digit numeric
Sex	Sex of the marine mammal (1=male, 2=female, 9=unknown).	1 digit numeric
Length	Straight length of the marine mammal, per standard protocols.	10 digit numeric
Reliability of Length	Indication of whether length was measured or estimated (ME=measured, ES=estimate).	2 digit character (Table A.3, Program Design)
Units of Length Measurement	Units of length measurement (CM=centimeters, IN=inches).	2 digit character (Table A.3, Program Design)
Weight	Weight of marine mammal.	10 digit numeric
Reliability of Weight	Indication of whether weight was measured or estimated (ME=measured, ES=estimate).	2 digit character (Table A.3, Program Design)
Units of Weight Measurement	Units of weight measurement (KG=kilograms, LB=pounds)	2 digit character (Table A.3, Program Design)
Remarks	General remarks.	50 digit character
Tissue/Skeletal Material Taken	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Disposition of Tissue/Skeletal Material	List of any samples collected and their disposition.	50 digit character

MARINE MAMMAL, SEA TURTLE, AND DEBRIS SIGHTING LOG

The purpose of this log is to record all marine mammal, sea turtle, and debris sightings. Also, the observer records sighting effort (time spent looking) for transit watches, including time when no sightings are made. This information is critical in determining the temporal and spatial distribution of these animals and debris, and the relative abundance and behavior of animals in the vicinity of fishing operations. Sea bird sightings are not recorded here.

The types of sightings and watches, and the proper procedures for conducting each type of watch are described in the Marine Mammal, Sea Turtle and Debris Watches section of the NEFSC Observer Program Training Manual.

Each time a transit watch is conducted, this effort must be recorded on the log with a "begin" watch and "end" watch record (see EVENT TYPE codes, #3). Begin and end watch times must be at least one minute apart. A sighting of a marine mammal, sea turtle or debris may NOT be recorded in the same record as a "begin" or "end" watch record. For gillnet fisheries, do not record begin and end haul watch information as this information is already recorded on the Gillnet Haul Log.

An animal must not be recorded on both the Marine Mammal, Sea Turtle, and Debris Sighting Log and the Marine Mammal, Sea Turtle, and Sea Bird Incidental Take Log. See the Marine Mammal, Sea Turtle, and Sea Bird Incidental Take Log in the NEFSC Observer Program Manual for more detailed instructions on deciding when an animal is a sighting versus an incidental take. An animal determined to be an incidental take is recorded on the Marine Mammal, Sea Turtle, and Sea Bird Incidental Take Log.

Any debris caught during a haul is recorded on the Haul Log (or the Individual Animal Log in pelagic fisheries) and not on this log.

INSTRUCTIONS

For instructions on completing fields A-C refer to the Common Haul Data section of the NEFSC Observer Program Manual.

1. TODAY'S DATE: Record the month, day, and year that the event being described occurred. Example: 03/20/01.

EVENT INFORMATION

TIME: Record the local time using the 24 hour clock (0000-2359) that the event being described occurred. Example: 20:32.

3. TYPE CODE: Indicate the type of event that occurred by recording the most appropriate two digit code:

For Watches Only - When a marine mammal, sea turtle, and debris watch is conducted, record one of the following begin/end watch event type codes:

01= Begin transit watch. 02 = End transit watch.

05= Begin haul watch. 06 = End haul watch.

NOTE: For gill net fisheries, do not record begin and end haul watch information as this information is already recorded on the Gillnet Haul Log.

For Sightings Only - When a marine mammal, sea turtle, or debris sighting is made, record one of the following sighting event type codes to indicate whether the observer is on- or off-effort, and to best describe the vessel activity at the time the sighting was made:

08 = On-effort, during dedicated watch.

11 = Off-effort, vessel stop/anchor/drift.

13 = Off-effort, transiting or searching.

15 = Off-effort, hauling in gear.

17 = Off-effort, waiting for J/V transfer.

00 = Unknown.

NOTE: If the sighting is made during a watch, the sighting event code is always "On-effort, during dedicated watch" (08).

NOTE: Use code 99 to describe dedicated sighting activity outside of the specified watches.

4. POSITION CODE: Indicate the location and position of the observer on the vessel at the time of this event by recording the most appropriate one digit code:

00 = Unknown.

02 = Wheelhouse, facing forward.

04 = Work deck, facing backward.

06 = Starboard side, facing net.

99 = Other, describe the position in COMMENTS.

NOTE: If the sighting is not seen by the observer, record "Other" (99), and describe in COMMENTS.

5. HAUL NUMBER: Record the haul number assigned to the haul in which any on-effort events or off-effort sightings occurred between the beginning and end of a haul. This number must agree with the number recorded for this haul on the corresponding Haul Log.

NOTE: If the event does not occur during a haul, record a dash (-).

6. LATITUDE/LONGITUDE OR LORAN: Record the latitude and longitude location, to the tenth of a minute, where the event occurred. If the latitude and longitude location is given in seconds, convert them to tenths of minutes. If latitude and longitude positions are not available, record the LORAN stations and bearings.

NOTE: See Appendix Q. Conversion Tables for a list of second ranges and corresponding conversions to tenths of minutes.

NOTE: If neither latitude/longitude or LORAN positions are available, record the statistical area as listed in Appendix E.1. Map of Statistical Areas of the Northeast U.S. or Appendix E.2. Map of Statistical Areas of the Southeast U.S.

ACCSP STATISTICAL AREA MAPS ARE IN DEVELOPMENT.

Example: 35 23.4 75 16.7 or 9960X 27054 9960Y 41824

NOTE: While 9960- loran chains are the most frequently used chains within this program's jurisdiction, in extreme northern and southern areas other chains may be used, such as:

Southern North Carolina: 7980-

7. WEATHER CODE: Indicate the weather at the time the event occurred by recording the appropriate two digit code:

00 = Unknown

01 = Clear

03 = Layers of Clouds

04 = Drizzle

06 = Showers 07 = Thunderstorms

08 = Rain and Fog

09 = Fog/thick haze

10 = Snow, or rain/snow mix

11 = Blowing snow

99 = other (describe in Comments)

8. WAVE HEIGHT: Record, in whole feet, the wave height at the time the event occurred. If the wave height is less than six inches, record "0". NOTE: This is not a range.

9. COMMENTS?: Indicate whether there is a comment associated with this event by recording the appropriate code:

0 = No.

1 = Yes.

IF THE EVENT RECORDED IS A MARINE MAMMAL, SEA TURTLE, OR DEBRIS SIGHTING, COMMENTS MUST BE INCLUDED. COMMENTS are recorded on the Marine Mammal, Sea Turtle, and Debris Sighting Comments Log. Each event has an unique EVENT TIME per day. Care should be taken to correctly record the matching EVENT TIME on both logs.

Sighting comments should include all field characteristics actually seen by the observer and used to make an identification of the animal. Any unusual marks, scars or coloration on the animal(s) should be noted. Size of animal(s) should be included if an estimation is possible. Record ranges of the number of animals sighted, including the number of calves. Behaviors of the animal(s) sighted should be included, such as swim speed and direction and any other activities noted while the animal(s) was (were) observed.

Observed associations with other vessels, marine life or oceanographic phenomena (i.e. wind rows, current lines, flotsam, jetsam or a dramatic change of water color in the immediate area) should also be included. If photographs were taken, record the ROLL NUMBER and FRAME NUMBERS.

It is important to document any marine debris, whether in the area of animals or not. The debris and its approximate size(s) should be described in general terms, e.g., plastic sheeting 1 meter square, trawl webbing 0.5(m) X 3.0(m), etc. If derelict gear is picked up on purpose to be disposed of properly, take photographs and record in COMMENTS any marine life that may be entangled. Debris entanglement and ingestion have been documented as sources of mortality for marine mammals, sea turtles, sea birds, fish, and shellfish (Shomura and Yoshida 1985). Sea turtles often utilize large pieces of debris for shelter.

SIGHTING INFORMATION

NOTE: If the record or event being recorded is not a sighting, leave the following fields (#10-#15) blank.

10. SPECIES NAME: Record the complete common name of each marine mammal, sea turtle, or debris sighted, as listed in **ACCSP Table A.8, Program Design**.

NOTE: If it is not possible to make a positive species identification, identify the animal to the most specific generic group of which you are positive, i.e. baleen whale, unidentified dolphin, seal, sea turtle, etc. DO NOT GUESS AT SPECIES IDENTIFICATION.

Examples: Unidentified Whale Harbor Porpoise.

11. SPECIES CODE: Leave this field blank.

12. NUMBER OF ANIMALS: Record the number of animals sighted. Do not record a range.

NOTE: If the sighting is debris, record a dash (-) in this field.

13. SIGHT CUE CODE: Indicate how the sighting was first detected by recording the appropriate code:

- 0 = Unknown.
- 1 = Sighted with naked eye.
- 2 = Sighted with binoculars.
- 3 = First sighted by captain or crew, then by observer.
- 4 = Sighted by captain or crew ONLY.
- 9 = Other, describe the sight cue in COMMENTS.

14. ANIMAL CONDITION CODE: Indicate the condition of the animal(s) sighted by recording the appropriate two digit code:

- 00 = Unknown, explain why you can not identify the animal condition in COMMENTS.
- 01 = Alive, condition unknown.
- 02 = Alive, not injured.
- 03 = Alive, injured, describe how the animal is injured in COMMENTS.

04 = Alive, hook/gear in/around mouth, attempt to determine where in the mouth the hook is, etc. and describe in COMMENTS.

05 = Alive, hook/gear in/around flipper, i.e. hook in the flipper or gear around the flipper.

06 = Alive, hook/gear in/around another single body part, i.e. hook in the neck or plastron; specify which in COMMENTS.

07 = Alive, hook/gear in/around several body parts, describe more fully in COMMENTS.

08 = Alive, seen by captain and/or crew ONLY.

10 = Dead, condition unknown.

11 = Dead, fresh.

12 = Dead, moderately decomposed.

13 = Dead, severely decomposed.

14 = Dead, seen by captain and/or crew ONLY.

NOTE: Codes 04-07 exist primarily to improve descriptions of sea turtles. However, these codes may be used, as appropriate, for other animals.

NOTE: If the sighting is debris, leave this field blank.

4 ANIMAL BEHAVIOR CODE: Indicate the initial behavior of the animal(s) when first sighted by recording the most appropriate two digit code:

00 = Unknown.

01 = Near gear, physical contact.

02 = Near gear, within 50 meters.

03 = Near gear, within 51 to 150 meters.

04 = Feeding on catch.

05 = Porpoising: the animal(s) is (are) splashing along at the surface, breaking the surface regularly, showing most of the body.

06 = Bow riding: the animal(s) is (are) observed keeping pace with vessel on the bow wave.

07 = Breaching: the animal(s) emerge(s) from the water and crash(es) down on a flank, back or belly.

08 = Swimming at surface: the animal(s) is (are) observed several times surfacing 'normally', each surfacing at some irregular distance from the previous one; it (they) appear(s) to be just moving along.

09 = Milling: the animal(s) is (are) rolling at the surface with no direction, making short dives without moving along. Often a group activity.

10 = Motionless at surface (or dead).

11 = Vessel avoidance: the animal(s) abruptly change(s) its (their) swimming direction or behavior to avoid the vessel; a startling, alarming, fleeing reaction.

12 = Vessel attraction: the animal(s) change(s) its (their) swimming direction to approach the vessel, such as a pod of dolphins purposefully heading toward the vessel to bowride.

99 = Other, describe the animal behavior in COMMENTS.

NOTE: If the animal(s) exhibit(s) multiple behaviors, record the code for the initial behavior only, and describe all subsequent behaviors in COMMENTS. If multiple initial animal behaviors exist for one sighting, record the lowest numerical code which applies, and record the other behaviors in COMMENTS.

NOTE: If the sighting is debris, leave this field blank.

Table 8.G. Overview of the ACCSP at-sea observer program for collection of quantitative release, discard, and protected species interactions data.

Reporting Requirement	Description / Criteria
Sampling Strategies	<p>All release/discard data should be collected at the haul level for commercial fisheries and at the drop level (each time gear is wet) for the for-hire fisheries.</p> <p>All release, discard, and protected species interactions monitoring programs should develop stratified random sampling procedures and a target sampling frame. Sampling strata should be determined on an issue-specific basis, as determined by the release/discard prioritization process (see Table 34). The generated sampling frame should include additional vessels to replace vessels that are not utilized. The general criteria to be used for not selecting a vessel should be when that particular vessel has participated in the program at least four times in one month or once per quarter for longer trips. All programs should indicate in the database the procedure used to select vessels, including reasoning for non-random selection.</p> <p>All ACCSP at-sea observer programs should provide documentation for those vessels that are not included in the sampling frame.</p> <p>Pilot surveys will be conducted to determine the appropriate level of observer coverage on a fishery-by-fishery basis to meet relevant management objectives of all fisheries based upon days at sea or fishing days (trip level for headboats) until such time as data are available for estimation of PSE (percent standard error) values.</p> <p>Recommended PSE values for both protected species and finfish is 20-30%</p> <p>Use of proportional sampling across all gear types and fisheries, recognizing some prioritization as need (statutory requirements) and data (high release/discard areas) dictate.</p>
Data Management and Submission	<p>Data submission should be on a trip basis.</p> <p>All release/discard data from commercial fisheries should be linked by the unique identifier to data collected through the commercial fishermen reporting system (Section 5.a.).</p> <p>Non-verified observer data should be made available for data entry 1-7 days after the trip return date, while finalized data should be provided 45 days after the last day of the month for which data was collected.</p>
Subsampling Protocols	<p>Subsampling priorities are as follows: 1) collect complete data on every haul; 2) collect partial data on every haul; and 3) collect partial data as often as possible. Specific subsampling procedures should be developed and documented by each collecting agency on a fisheries-specific basis (see the ACCSP Quality Control/Assurance Document and general subsampling guidance).</p> <p>Basic data elements to be collected on all unobserved hauls include: vessel/trip header information, haul number, time set, time retrieved, estimated kept catch, gear number, lat/long begin, and lat/long end.</p>

Minimum standard data elements to be collected through the ACCSP at-sea observer program for collection of quantitative release, discard, and protected species interactions data for commercial fisheries.

Data Element	Description / Criteria	Format
Vessel Information		
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number) These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel (if applicable)	20 digit character
Individual Identifier	An identifier unique to an individual (i.e. operator license number), traceable through time and space	11 digit character
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	<i>To Be Developed</i>
Trip Information		
Reporting Form Series Number	Individual number for each reporting form, to be assigned by the collecting agency (i.e., trip ticket number). This data element may be blank in the dual reporting system.	12 digit alphanumeric
Form Type/Version Number	Version identification number for the ACCSP reporting form.	12 digit alphanumeric
Trip start	Date the trip started (this is unique to each trip and can be used to tie multiple unloadings into a trip record). A trip is shore to shore by gear/area combination, or in the case of transfers at sea, an off-loading at sea is a trip. This information should include trips with effort but no catch.	MM/DD/YYYY
Target Species or Species Group 1	The first target species or species group for that trip/haul.	ITIS 11 digit character (Table A.8 Program Design)
Target Species or Species Group 2	The second target species or species group for that trip.	ITIS 11 digit character (Table A.8 Program Design)
Target Species or Species Group 3	The third target species or species group for that trip.	ITIS 11 digit character (Table A.8 Program Design)
State Landed	The state where the product was landed or unloaded.	2 digit character postal code (Table A.9 Program Design)
Port Landed	The location within a state where the product was landed/unloaded.	5-digit FIPS code (Table A.9 Program Design)

Table 8.H. (cont'd)		
Trip Number	Sequential number representing the number of trips taken in a single day by either a vessel or individual. The trip number will default to “one” when only a single trip is conducted.	2 digit numeric
Data Element	Description / Criteria	Format
Primary Gear	The primary gear used to catch the landed species.	3-digit numeric (Table A.4 Program Design)
Primary Area Fished	Statistical area and distance from shore where most hauls occurred. The distance from shore where fishing occurred [inland (less than 0 nautical miles...nm), nearshore (0-3 nm on Atlantic coast, 0-9 nm on Florida and Texas Gulf coast), EEZ (3-200 nm on Atlantic coast, 9-200 nm on Florida and Texas Gulf coast), territorial seas (in the USVI and Puerto Rico (12 nm), and international (>200 nm)] is embedded in this code.	3-digit numeric plus 2 decimals (Table A.3 and Tables A1 - A.10 Program Design) and area figures when revised
Number of Hauls	Total number of hauls of gear during a trip.	3 digit numeric (Table A.2, Program Design)
Haul Information		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character
Gear(s)	The type(s) of gear used to catch the landed species.	3 digit character (Table A.4, Program Design)
Quantity of Gear	The amount of gear employed.	4-digit numeric (Table 22, Program Design)
Haul Number	Sequential number for unique locations where gear was hauled, representing the number of hauls taken in a single trip by either a vessel or individual.	3 digit numeric
Haul Observed	Indication of whether the haul was actually observed (0=haul not observed,, 1=complete catch data collected, 2=complete release/discard data only, 3=partial release/discard data, 4=observed kept portion, not release/discard data).	1 digit character
Target Species or Species Group 1	The first target species or species group for that haul.	ITIS 11 digit character (Table A.8, Program Design)
Target Species or Species Group 2	The second target species or species group for that haul.	ITIS 11 digit character (Table A.8, Program Design)

Table 8.H. (cont'd)		
Data Element	Description / Criteria	Format
Target Species or Species Group 3	The third target species or species group for that haul.	ITIS 11 digit character (Table A.8, Program Design)
Lat Begin	The latitude at the beginning of the haul.	6 digit numeric plus 1 character (2 decimal minutes)
Long Begin	The longitude at the beginning of the haul.	7digit numeric plus 1 character (2 decimal minutes)
Lat End	The latitude at the end of the haul.	6 digit numeric plus 1 character (2 decimal minutes)
Long End	The longitude at the end of the haul.	7digit numeric plus 1 character (2 decimal minutes)
Time Set	The time the gear was set. Used with time hauled to derive fishing time	MO:DD:HH:MM
Time Retrieved	The time the gear was hauled. Used with time set to derive fishing time	MO:DD:HH:MM
Depth Fished	Depth in fathom at which the gear is fished.	4 digit numeric plus 1 decimal
Minimum Bottom Depth	Minimum depth of bottom in fathoms.	4 digit numeric plus 1 decimal
Maximum Bottom Depth	Maximum depth of bottom in fathoms.	4 digit numeric plus 1 decimal
Deterrent Devices Operational	Indication of whether deterrent devices were operational during the haul	1 digit character (Y/N)
Deterrent Device	Indication of whether deterrent devices were used during the haul (0= pinger, 1= tory lines, 2 = deflectors, 3= other).	1 digit character
Deterrent Device 2	Indication of whether deterrent devices were used during the haul (0= pinger, 1= tory lines, 2 = deflectors, 3= other).	1 digit character
Deterrent Device 3	Indication of whether deterrent devices were used during the haul (0= pinger, 1= tory lines, 2 = deflectors, 3= other).	1 digit character
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit numeric

Table 8.H.(cont'd)		
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Data Element	Description / Criteria	Format
Subsample Log - SEE TABLE 20 FOR PRIORITIES		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character
Haul Number	Sequential number for unique locations where gear was hauled, representing the number of hauls taken in a single trip by either a vessel or individual.	3 digit numeric
Subsample Amount or Weight	The total amount, in whole pounds, numbers, or other appropriate unit of measurement of each marine species that is landed, sold, released, discarded, etc. Quantity of protected species should be measured in numbers. This data element is linked to the units of measurement and disposition code for exact characterization of the quantity. For some species, especially protected species, these data are needed on a set basis.	8 digit numeric plus two decimals
Units of Measurement for Subsample Weight	Units of measurement for subsample weight (i.e., each, pounds, numbers, etc.)	2 digit character (Table A.3, Program Design)
Species	The species for each species of marine resources landed, sold, released, discarded, etc. Each species is to be identified separately. Use of market or generalized categories is to be avoided within species code fields or variables.	ITIS 11 digit character (Table A.8, Program Design)
Disposition	Fate of the product (i.e. releases, discards, bait, industrial use, personal consumption, marine mammal interactions, etc.). Disposition of releases and discards should be recorded (i.e. regulatory versus other releases and discards, dead or alive).	3 digit character (Table A.5, Program Design)
Grade	Any grade categories that affect price, usually size related.	2 digit numeric (Table A.7, Program Design)
Subsample Quantity	The amount, in whole pounds, numbers, or some other appropriate unit of measurement of each marine species that is landed, sold, released, discarded, etc. Quantity of protected species should be measured in numbers. This data element is linked to the units of measurement and disposition code for exact characterization of the quantity. For some species, especially protected species, these data are needed on a set basis.	8 digit numeric plus two decimals
Units of Measurement	Units of measurement for quantity (i.e. each, pounds, bushels, etc.).	2 digit character (Table A.3, Program Design)
Estimated or Actual	How was quantity collected (0=actual, 1=estimated).	1 digit character

Table 8.H.		
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(cont'd)		
Data Element	Description / Criteria	Format
Biological Sample Weight	Weight of subsample for biological sampling	8 digit numeric plus two decimals
Minimum Data Required for Observed Entanglements		
Field Number	Assigned by responding organization. Used to identify individual stranded animals.	
Haul Number	Sequential number for unique locations where gear was hauled, representing the number of hauls taken in a single trip by a vessel or individual.	3 digit numeric
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit numeric
Entanglement Situation Code	<p>MUST BE ADDED TO APPENDIX A.5, ACCSP PROGRAM DESIGN</p> <p>00 - unknown 01 - fell from gear, point unknown 02 - fell from gear before exiting water 03 - fell from gear once out of water 04 - fell from gear due to force of roller 05 - removal requires cutting gear or animal 06 - removal does not require cutting gear/animal 99 - other</p> <p>Longline Gear Only 07 - foul hooked, cut from gear 08 - foul hooked, removed from gear 10 - bird caught - gangion attached to line 11 - bird caught - gangion not attached to line</p>	2 digit character
Net Number (gillnet only)	Consecutive number assigned to that net where the animal is entangled.	2 digit numeric
Number of Floats (gillnet only)	Number of floats counted from where the animal is entangled to the nearest endline	3 digit numeric
Meters Below Floatline	Indication of where in the gear the animal was captured.	3 digit numeric
Taken on Set or Retrieval	Indication of when the animal was captured (1=set; 2=haul)	1 digit character

Table 8.H.		
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(cont'd)		
Data Element	Description / Criteria	Format
Condition of Animal	Indication of the condition of the animal when released; record most appropriate code (0=unknown; 1=alive, condition unknown; 2=alive, not injured; 3=alive, injured; 4=alive, gear in/around mouth; 5=alive, gear in/around flipper; 6=alive, gear in/around another single body part; 7=alive, gear in/around multiple body parts; 8=alive, seen by captain/crew only; 10=dead, condition unknown; 11=dead, fresh; 12=dead, moderately decomposed; 13=dead, severely decomposed; 14=dead, seen by captain/crew; 99=other	2 digit numeric
Comments	Include information on where gear is on the animal and what part of the gear entangled the animal	50 digit character
Biological Information		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character
Haul Number	Sequential number for unique locations where gear was hauled representing the number of hauls taken in a single trip by either a vessel or individual.	3 digit numeric
Species	The species for each species of marine resources landed, sold, released, discarded, etc. Each species is to be identified separately. Use of market or generalized categories is to be avoided within species code fields or variables.	ITIS 11 digit character (Table A.8, Program Design)
Disposition	Fate of the product (i.e. releases, discards, bait, industrial use, personal consumption, marine mammal interactions, etc.). Disposition of releases and discards should be recorded (i.e. regulatory versus other releases and discards, dead or alive).	3 digit character (Table A.5, Program Design)
Minimum Data for Marine Mammals		
Species	Species of each marine mammal observed	ITIS 11 digit character (Table A.8, Program Design)
Photo(s)	Were photos taken? (0=no; 1=yes) – Photo should include the tag number and trip identifier, where applicable.	1 digit numeric
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied. (0=unknown; 1=taken without tag, then tagged; 2=taken without tag, and not tagged; 3=taken with a tag, and retagged; 4=taken with a tag, and not retagged).	1 digit character

Table 8.H.		
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(cont'd)		
Data Element	Description / Criteria	Format
Length	Straight measurement as per protocols.	10 digit numeric
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Indicate whether length was measured or estimated (0=actual; 1=estimated)	1 digit character
Gender	1=male, 2=female, 3=unknown	1 digit character
Biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text
Tag ID Number(s)	Tag number from pre-existing or newly applied tags.	12 digit character
Minimum Data for Sea Turtles		
Species	Species of each sea turtle observed	ITIS 11 digit character (Table A.8, Program Design)
Photo(s)	Were photos taken? (0=no; 1=yes) – Photo should include the tag number and trip identifier, where applicable.	1 digit character
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied. (0=unknown; 1=taken without tag, then tagged; 2=taken without tag, and not tagged; 3=taken with a tag, and re-tagged; 4=taken with a tag, and not re-tagged).	1 digit character
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Indicate whether length was measured or estimated (0=actual; 1=estimated)	1 digit numeric
Straight Carapace Length	Straight length of carapace from notch to notch (requires use of calipers)	5 digit numeric
Curved Carapace Length	Curved length of carapace from notch to notch (requires use of flexible measuring tape).	5 digit numeric

Table 8.H. (cont'd)		
Data Element	Description / Criteria	Format
Straight Carapace Width	Straight width of carapace from notch to notch (requires use of calipers)	5 digit numeric
Curved Carapace Width	Curved width of carapace from notch to notch (requires use of flexible measuring tape)	5 digit numeric
Width Type	Indicate whether width was measured or estimated (0=actual; 1=estimated)	1 digit numeric
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit numeric
Text Field	Comments or uncoded data	Text Field
Minimum Data for Fish and Crustaceans		
Species	Species of fishes and crustaceans observed	ITIS 11 digit character (Table A.8, Program Design)
Photo	Were photos taken? (0=no; 1=yes) – Photo should include the tag number and trip identifier, where applicable.	1 digit character
Length	Length measurement as per protocols.	10 digit numeric
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Type of length measurement (centerline, standard, total, etc.).	2 digit character (Table A.3, Program Design)
Gender	1=male, 2=female, 3=unknown.	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Minimum Data for Birds		
Species	Species of observed birds	ITIS 11 digit character (Table A.8, Program Design)
Photo	Were photos taken? (0=no; 1=yes) – Photo should include the tag number and trip identifier, where applicable.	1 digit character
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied.	1 digit character

Table 8.H.		
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(cont'd)		
Gender	1=male, 2=female, 3=unknown.	1 digit character
Age Class	Indication of age class (1=immature, 2=mature, 3=unknown).	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text Field

Gear Log	See Tables 8.I. - 8.R. for specific data elements to be collected on each gear type and linked back to the haul log.
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Standard measurements of quantity of gear, fishing time, number of sets, time set and retrieved, and depth fished for specific gear types. These measurements must be used in the at-sea observer release/discard monitoring program to ensure consistency between programs.

Type of Gear	Quantity	Fishing Time	Number of Sets	Time Set/retrieved	Depth Fished (REVIEW)
Traps and Pots	Number traps pulled	Mean soak time		Set: when first pot goes over Retrieved: from the moment buoy line is retrieved	Bottom depth
Trawls	Number of nets towed	Total tow time	Number of tows	Set: when winch stops Retrieved: when winch starts	Bottom of net
Gill Nets Entanglement	Total Net Length, number of sets to number of hauls	Soak time	Number of string (net) hauls	Set: when first buoy goes over Retrieved: when last buoy comes on board	Depth of floatline
Longlines	Number gangions/hooks	Soak time	Number of hauls	Set: start of set Retrieved: retrieval of set	Depth of set
Dredges	Number pulled	Total tow time	Number of tows	Set: when winch stops Retrieved: when winch starts	Bottom depth
Nets	Number of pieces of apparatus	Soak time		Set: when first net goes over Retrieved: from the moment buoy line is retrieved	Bottom of net
Hook and Line	Number of lines (Number of hooks is secondary)	Soak time (not including transit time)	N/A	Set: when first lines are lowered Retrieved: when last lines are pulled up	Bottom fishing - bottom depth Trolling - average depth fished between set and retrieval
Purse Seines	Length of floatline	Soak time	Number of sets	Search Start: When nets placed in Search Stop: nets removed	Bottom depth
By Hand	N/A	Actively Fishing	N/A	N/A	Bottom depth
Spear and Gig	Number	Search time	N/A	N/A	N/A
Haul Seines	Length of net	Soak Time		Set: seine in Retrieved: seine out	

NOTE: Quantifiers must be assigned for each specific gear

Specific gear data elements for gill net fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit numeric (Table A.4 Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit numeric
<i>Gear Characteristics</i>		
Number of Net Panels	Total number of net panels used in the gear.	2 digit numeric
Length of Net Panels	Average horizontal distance in feet of the net panel on the gear as measured along the floatline.	3 digit numeric
Mesh Count, Vertical	Average number of vertical meshes for this gear type.	2 digit numeric
Net Height	Average height of net measured in feet at the endline.	2 digit numeric plus 1 decimal
Net Color	Color or combination of colors that best describe individual net panels (00=unknown, 01=clear, 02=white, 03=pink, 04=black, 05=green, 06=blue, 07=multicolor, 08=red, 09=orange, 10=purple, 98=combination, 99=other)	2 digit character

Table 8.I. (cont'd)		
Data Element	Description / Criteria	Format
Hanging Ratio	Average ratio of the number of meshes to the length of the floatline they are attached to.	1 digit numeric plus 2 decimals
Minimum Mesh Size	Minimum mesh size of the net panels. To be collected only if panel mesh size is not recorded.	2 digit numeric plus 2 decimals
Maximum Mesh Size	Maximum mesh size of the net panels. To be collected only if panel mesh size is not recorded.	2 digit numeric plus 2 decimals
Minimum Twine Size	Minimum twine size of the net panels. To be collected only if panel twine size is not recorded.	2 digit numeric (Table A.11 Program Design for conversions)
Maximum Twine Size	Maximum twine size the net panels. To be collected only if panel twine size is not recorded.	2 digit numeric (Table A.11 Program Design for conversions)
Net Material	Type of material used to construct the majority of the net (0=unknown, 1=mono, 2=multi-mono, 3=multistrand, 9=other)	1 digit character
Floatline Material	Type of material used to construct the majority of the floatline (0=unknown, 1=floating with foam core, 2=twisted poly, 9=other)	1 digit character
Float Distance	Average distance in inches between floats; measured from center to center.	2 digit numeric
Float Type	The material used to construct the majority of floats (0=unknown, 1=plastic, 2=styrofoam, 9=other)	1 digit character
Float Diameter	Average float diameter measured in centimeters.	2 digit numeric
Leadline Weight	Weight of leadline measured in pounds per 100 fathoms.	3 digit numeric
Additional Leadline Weight	Total weight in pounds of additional weights added to leadline, not including the leadline weight.	3 digit numeric
Length of Tiedowns	Average length of tiedown measured in feet	1 digit numeric plus 1 decimal

Table 8.I. (cont'd)		
Data Element	Description / Criteria	Format
Distance Between Tiedowns	Average distance between tiedowns measured in feet	2 digit numeric plus 1 decimal
Length of Buoyline	Average length of buoyline in feet, measured from the floats at the water surface	2 digit numeric
Anchor Weight	Total weight of anchor(s) in pounds holding gear in place	3 digit numeric
# Nets at each Mesh Size	Number of nets and corresponding mesh size (next element), to the nearest 1/10 inch	2 digit numeric
Mesh Size	Mesh size corresponding to # nets element	2 digit numeric plus 1 decimal
Floatline Length	Length of floatline, in feet	5 digit numeric
# Floats	Number of floats used	5 digit numeric
Leadline Length	Length of leadline, in feet	5 digit numeric
Space between Net Panels	Number of spaces used between nets	3 digit numeric
Weighted Width of Spaces between Net Panels	To the nearest foot, the weighted average width of space(s) used between nets	2 digit numeric
Number of Spaces	Total number of spaces between nets	3 digit numeric
Anchor Method	Type of method used to anchor the gear (0=unknown, 1=tied to vessel only, 2=anchored only, 3=tied to vessel and anchored, 9=other).	1 digit character
Net Information		
Mesh Size	The distance between knot to knot of stretched mesh.	2 digit numeric plus 2 decimals
Twine Size	Twine size derived from the diameter of the net webbing.	2 digit numeric (Table A.11 Program Design for conversions)
Text Field	Comments or uncoded data	Text

Specific gear data elements for trawl fisheries (to be collected through a gear log and linked to the haul log - Table 8.H).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit numeric (Table A.4 Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit numeric
Gear Characteristics		
Net Name	Common name for net - if no common name, indicate net manufacturer and other relevant information.	25 digit character
Net Position	Net position relative to vessel and other nets (1=out/port, 2=in/port, 3=in/stbd, 4=out/stbd, 5=trytrawl (comments on gear config sheet where fished), 6=stern trawl).	1 digit numeric
Door Type	Common name of door type, include construction material	25 digit character
Door Length	Length of the sled edge in feet	4 digit numeric plus 2 decimals
Door Height	Height of door in feet.	4 digit numeric plus 2 decimals
Door Weight	Weight of door in pounds.	4 digit numeric
Net Construction Material Type	Primary construction material of net body (00=unknown, 01=nylon, 02=poly, 99=other).	2 digit character

Table 8.J. (cont'd)		
Data Element	Description / Criteria	Format
Headrope Length	Length of headrope in feet.	3 digit numeric plus 2 decimals
Footrope/Sweep Length	Length of footrope/sweep in feet.	3 digit numeric plus 2 decimals
Ground Cable Length	Length of ground cable in feet.	3 digit numeric plus 2 decimals
Top Bridle Length	Length of top bridle in feet.	3 digit numeric plus 2 decimals
Bottom Bridle Length	Length of bottom bridle in feet.	3 digit numeric plus 2 decimals
Number of Meshes in the Fishing Circle	Number of meshes at the area of largest opening in the net	4 digit numeric
Mesh Size in the Fishing Circle	Size of mesh opening	3 digit numeric plus 1 decimal
Mesh Type in the Fishing Circle	Type of mesh used in fishing circle (1=square, 2=diamond).	1 digit character
Measurement Type in the Fishing Circle	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Codend Hung	Hanging configuration of codend (1=diamond, 2=square, 3= square wrapped, 4=combination, 5=other, 6=unknown).	1 digit character
Codend Twine Type	Twine type (number of strands) in codend of net (1=single, 2=double).	1 digit character
Codend Twine Material	Material used to construct codend (00=unknown, 01=nylon, 02=poly, 99=other).	2 digit character
Codend Twine Diameter	Diameter of twine used in codend in millimeters.	2 digit numeric
Codend Mesh Size	Size of mesh opening in codend.	3 digit numeric plus 1 decimal
Liner Used	Is a liner used in codend? (0=no, 1=yes)	1 digit character
Liner Mesh Size	Size of liner mesh opening.	3 digit numeric plus 1 decimal
Liner Mesh Type	Mesh type used in liner (1=square, 2=diamond).	1 digit character
Codend Strengthened Used	Is a strengthener used on codend? (0=no, 1=yes)	1 digit character

Table 8.J (cont'd)		
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(cont'd)		
Data Element	Description / Criteria	Format
Codend Chaffing Gear Used	Is chaffing gear used on codend? (0=none, 1=bottom half, 2=all the way around)	1 digit character
Codend Length	Number of meshes in length of codend.	3 digit numeric
Codend Circumference	Number of meshes in widest circumference in codend.	3 digit numeric
Codend Mesh Size	Size of mesh opening in the codend.	3 digit numeric plus 1 decimal
Codend Mesh Type	Mesh type used in codend (1=square, 2=diamond).	1 digit character
Codend Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Graduated Mesh in Net Body	Is the mesh size used in the body of the net the same size throughout? (0=no, 1=yes)	1 digit character
Minimum Mesh Size in Net Body	Size of opening of smallest mesh.	3 digit numeric plus 1 decimal
Maximum Mesh in Net Body	Size of opening of largest mesh.	3 digit numeric plus 1 decimal
Net Body Mesh Type	Mesh type used in net body (1=square, 2=diamond).	1 digit character
Net Body Mesh Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Cable Type	Type of ground gear used on ground cable (0=none, 1=chain, 2=cable, 3=wrapped cable, 4=rock hopper, 5=roller, 6=rubber cookie, 7=bobbin, 9=other, 10=unknown).	2 digit character
Cable Diameter	Maximum diameter in centimeters of ground gear.	3 digit numeric plus 2 decimals
Leg/Bridle Type	Type of ground gear used on leg/bridle (0=none, 1=chain, 2=cable, 3=wrapped cable, 4=rock hopper, 5=roller, 6=rubber cookie, 7=bobbin, 9=other, 10=unknown).	2 digit character
Leg/Bridle Diameter	Maximum diameter of leg/bridle in millimeters.	3 digit numeric plus 2 decimals
Footrope Type	Type of ground gear used on footrope (0=none, 1=chain, 2=cable, 3=wrapped cable, 4=rock hopper, 5=roller, 6=rubber cookie, 7=bobbin, 9=other, 10=unknown).	2 digit character

Table 8.J (cont'd) Table 24 (cont'd).		
Data Element	Description / Criteria	Format
Footrope Diameter	Maximum diameter of footrope in millimeters.	3 digit numeric plus 2 decimals
Trawl Extension Mesh Size	Size of mesh opening in the trawl extension.	3 digit numeric plus 1 decimal
Trawl Extension Mesh Type	Mesh type used in the trawl extension (1=square, 2=diamond).	1 digit character
Trawl Extension Mesh Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Tickler Chain Length	Length of chain in feet.	3 digit numeric plus 2 decimals (0.0 = not used)
Tickler Chain Size	Stock size of the chain.	2 digit numeric plus 2 decimals
Number of Floats on Headrope	Number of floats on headrope.	2 digit numeric
Floatation Diameter	Maximum diameter of most common float size in centimeters.	3 digit numeric plus 2 decimals
Loop Chain Length	Length of chain in feet.	3 digit numeric plus 2 decimals (0.0=not used)
Data Element	Description / Criteria	Format
# of Links Per Loop	Number of chain links between two attachments to the footrope.	2 digit numeric
# of Loops Per Net	Number of chain links between two attachments to the footrope.	2 digit numeric
Type of Release/discard Reduction Device	The type of release/discard reduction device used in the trawl (0=none, 1=TED, 2=finfish excluder 3=finfish deflector, 4=combination 5=other, 6=unknown).	1 digit character
Additional Gear Characteristics for Skimmer Trawls		
Frame Material	Primary construction material of frame (1=aluminum, 2=steel, 9=unknown).	1 digit character
Frame Width	Width of frame in feet.	2 digit numeric plus 1 decimal
Shoe Length	Length of shoe in inches, which is attached to the outer, lower part of the frame.	2 digit numeric plus 1 decimal
Loop Chain Size	Stock size of chain.	2 digit numeric plus 2 decimal points

Table 8.J. (cont'd) (cont'd) Table 8.I. (cont'd)Ta		
Data Element	Description / Criteria	Format
Weight of Bullet	Weight of bullet in pounds, which is attached to the inner, lower part of the frame and acts as a counterweight.	3 digit numeric
Attachment Point of Tickler Chain	Distance from the footrope to the point of attachment of the tickler chain in inches.	3 digit numeric
Net Body Material	Primary construction material of net body (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Codend Material	Primary construction material of codend (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Codend Twine Size	Twine size of codend in millimeters.	2 digit numeric (Table A.11, Program Design for conversions)
Additional Gear Characteristics for Raised Footrope Trawls		
Dropper Chain Size	Stock size of dropper chain.	2 digit numeric plus 2 decimals
Dropper Chain Sweep Length	Sweep length of dropper chain in feet.	3 digit numeric
Number of Vertical Dropper Chains	Number of vertical dropper chains.	2 digit numeric
Length of Vertical Dropper Chains	Length of vertical dropper chains in feet.	3 digit numeric plus 2 decimals
Gear Characteristics of Beam Trawls		
Construction Material of Fishing Circle	Primary construction material of fishing circle (00=unknown, 01=nylon, 02=poly, 99=other).	1 digit character
Number of Meshes in the Fishing Circle	Number of meshes at the area of largest opening in the net	4 digit numeric
Mesh Size in the Fishing Circle	Size of mesh opening	3 digit numeric plus 1 decimal
Mesh Type in the Fishing Circle	Type of mesh used in fishing circle (1=square, 2=diamond).	1 digit character
Measurement Type in the Fishing Circle	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character

Table 8.J. (cont'd)		
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Data Element	Description / Criteria	Format
Codend Material	Primary construction material of codend (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Codend Chaffing Gear Used	Is chaffing gear used on codend? (0=none, 1=bottom half, 2=all the way around)	1 digit character
Codend Length	Number of meshes in length of codend.	3 digit numeric
Codend Circumference	Number of meshes in widest circumference in codend.	3 digit numeric
Codend Mesh Size	Size of mesh opening in the codend.	3 digit numeric plus 1 decimal
Codend Mesh Type	Mesh type used in codend (1=square, 2=diamond).	1 digit character
Codend Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Codend Twine Material	Material used to construct codend (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	2 digit character
Codend Twine Diameter	Diameter of twine used in codend in millimeters.	2 digit numeric
Codend Liner Mesh Size	Size of mesh opening in codend (0=none used).	3 digit numeric plus 1 decimal
Codend Liner Mesh Type	Mesh type used in codend (1=square, 2=diamond).	1 digit character
Codend Liner Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar). This should be consistent for all mesh measurements.	1 digit character
Footrope Length	Length of footrope in feet.	3 digit numeric plus 2 decimals
Footrope Type	Type of ground gear used on footrope (0=none, 1=chain, 2=cable, 3=wrapped cable, 4=rock hopper, 5=roller, 6=rubber cookie, 7=bobbin, 9=other, 10=unknown).	2 digit character
Footrope Diameter	Maximum diameter of footrope in millimeters.	3 digit numeric plus 2 decimals

Table 8.J. (cont'd)		
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Data Element	Description / Criteria	Format
Headrope Length	Length of headrope in feet.	3 digit numeric plus 2 decimals
Headrope Attachment Points	Points of attachment of headrope (1=all along length of beam, 2=outside edges of beam, 3=other, 9=unknown).	1 digit character
Number of Floats on Headrope	Number of floats on headrope.	2 digit numeric
Number of Bridles	Number of bridles per beam.	2 digit numeric
Bridle Length	Length of bridle in feet.	3 digit numeric plus 2 decimals
Bridle Attachment Points	Points of attachment of bridle (1=all along length of beam, 2=outside edges of beam, 3=other, 9=unknown).	1 digit character
Location of Additional Weights	Location of additional weights.	1 digit character
Weight of Additional Weights	Total weight of additional weights in pounds.	3 digit numeric plus 2 decimals
Loop Chain Length	Length of chain in feet.	3 digit numeric plus 2 decimals (0.0=not used)
Loop Chain Size	Stock size of chain.	2 digit numeric plus 2 decimals
# of Links Per Loop	Number of chain links between two attachments to the footrope.	2 digit numeric
# of Loops Per Net	Number of chain links between two attachments to the footrope.	2 digit numeric
Type of Release/discard Reduction Device	The type of release/discard reduction device used in the trawl (0=none, 1=TED, 2=finfish excluder 3=finfish deflector, 4=combination 5=other, 6=unknown).	1 digit character
Beam Weight	Weight of beam in pounds.	3 digit numeric plus 2 decimals
Beam Shoe Width	Width of beam shoe in inches.	2 digit numeric plus 1 decimal
Beam Width	Width of beam in feet.	2 digit numeric plus 1 decimal
Beam Maximum Diameter	Maximum diameter of beam in centimeters.	3 digit numeric plus 2 decimals
Beam Height	Height of beam in feet.	2 digit numeric plus 1 decimal

Table 8.J. (cont'd) Table 24 (cont'd).		
Data Element	Description / Criteria	Format
Beam Fishing Opening Height	Height of beam fishing opening in feet.	2 digit numeric plus 1 decimal
Beam Fishing Opening Width	Width of beam fishing opening in feet.	2 digit numeric plus 1 decimal
Beam Material	Primary construction material of beam (0=unknown, 1=steel, 2=wood, 3=fiberglass, 9=other).	1 digit character
Number of Rock Chains	Number of rock chains used (0=none used).	2 digit numeric
Number of Tickler Chains	Number of tickler chains (0=none used).	2 digit numeric
Chain Bag Used	Indication of whether a chain bag was used (0=no, 1=yes).	1 digit character
Chaffing Gear Used on Chain	Indication of whether chaffing gear was used (0=no, 1=yes).	1 digit character
Average Number of Links Between Rings in Chain	Number of links between rings.	1 digit numeric
Inside Chain Ring Size (top of bag)	Inside diameter of rings in inches.	2 digit numeric plus 2 decimal points
Inside Chain Ring Size (bottom of bag)	Inside diameter of rings in inches.	2 digit numeric plus 2 decimal points
Chain Length	Number of rings from club, stick or terminal end of dredge to dredge frame.	3 digit numeric
Text Field	Comments or uncoded data	Text

Specific gear data elements for longline fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit numeric (Table A.4 Program Design)
Gear Characteristics		
Number of Hooks	Average hooks per set (round to nearest whole number) over the entire trip.	4 digit numeric
Mainline Diameter	Diameter of mainline in millimeters.	3 digit numeric plus 1 decimal
Mainline Test	Strength of line in pound strength.	4 digit numeric
Mainline Material	Primary construction material of mainline (1=nylon, 2=cotton, 3=steel wire, 9=other).	1 digit character
Number of Strands in Mainline	Number of strands in mainline.	2 digit numeric
Mainline Color	Predominant colors used in the mainline (1=clear, 2=white, 3=pink, 4=black, 5=green, 6=blue, 7=multi-color, 8=red, 9=other).	2 digit character
Dropline Minimum Length	Shortest dropline length in feet (rounded to nearest whole number).	3 digit numeric
Dropline Maximum Length	Longest dropline length in feet (rounded to nearest whole number).	3 digit numeric
Gangions Diameter	Diameter of gangions in millimeters.	3 digit numeric plus 1 decimal
Gangions Test	Strength of line in pound strength.	3 digit numeric

Table 8.K. (cont'd) Table 25 (cont'd)		
Data Element	Description / Criteria	Format
Gangions Material	Primary construction material of gangions (1=nylon, 2=cotton, 3=steel wire, 9=other).	1 digit character
Distance Between Gangions	Distance between hooks (round in whole feet).	4 digit numeric
Gangions Color	Predominant colors of gangions (1=clear, 2=white, 3=pink, 4=black, 5=green, 6=blue, 7=multi-color, 8=red, 9=other).	2 digit character
Gangion Minimum Length	Shortest dropline length used in feet (rounded to nearest whole number).	3 digit numeric
Gangion Maximum Length	Longest dropline length used in feet (rounded to nearest whole number).	3 digit numeric
Leader Length	Average total length of leader (rounded to whole inches) (0=none used).	4 digit numeric
Leader Test	Strength of line in pound strength.	3 digit numeric
Leader Material	Type of leader material (1=nylon, 2=cotton, 3=steel wire, 9=other).	1 digit character
Hook Brand	Manufacturer brand name.	10 digit character
Hook Model/Pattern Number	Hook number assigned by manufacturer.	10 digit character
Hook Size	Manufacturer hook size with slash included.	4 digit character
Number of Light Sticks	Average total count of light sticks, calculated based on light sticks per set during trip (0=none used).	4 digit numeric
Light Stick Color(s)	Predominant color of light sticks (1=clear, 2=white, 3=pink, 4=black, 5=green, 6=blue, 7=multi-color, 8=red, 9=other, 10=yellow, 11=purple).	2 digit character
Number of Floats	Average total count of polyballs and/or dobs used per set for the trip (0=none used)	3 digit numeric
Number of Hooks Between Floats	Total count of hooks (round to whole numbers) between floats.	4 digit numeric
Anchor Weight	Total anchor weight in whole pounds (0=none used).	3 digit numeric
Anchor Weight/Actual or Estimated	Indication of how weight was measured (1=actual, 2=estimated).	1 digit numeric
Bait	Predominant species used as bait.	ITIS 11 digit character (Table A.8 Program Design)
Text Field	Comments or uncoded data	Limited to Text

Table 8.L. Specific gear data elements for dredge fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4 Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics		
Dredge weight	Estimated weight of dredge frame and bag in pounds.	5 digit numeric
Width of dredge shoe	Width of dredge shoe in inches at widest point.	3 digit numeric plus 2 decimals
Number of Digby/Rock Buckets per dredge	Number of buckets on Digby dredge.	2 digit numeric
Bucket Width	Width of bucket opening in inches.	3 digit numeric plus 2 decimals
Bucket Height	Height of bucket opening in inches.	3 digit numeric plus 2 decimals
Frame Height	Height of dredge frame in inches - bottom of cutting bar to top of pressure plate or top of frame.	3 digit numeric plus 2 decimal points
Frame Width	Width of frame at the widest point in inches.	3 digit numeric plus 2 decimal points
Fishing Opening Height	Height of fishing opening from bottom of cutting bar or shoe to bottom of upper frame in inches.	3 digit numeric plus 2 decimal points

Table 8.L. (cont'd)		
Data Element	Description / Criteria	Format
Fishing Opening Width	Inside measure of the widest point in dredge frame in feet.	3 digit numeric plus 2 decimals
Cutting Bar Used	Type of cutting bar used (0=none, 1= bar only, 2 = bar with teeth, 8 = other, 9 = unknown).	1 digit character
Angle of cutting bar/teeth	Angle of teeth or cutting bar in relation to horizontal in degrees.	2 digit numeric
Depth of cutting bar/teeth	Maximum depth bar/teeth cut into sediment in inches.	2 digit numeric plus 2 decimals
Teeth spacing	Space between teeth in inches.	2 digit numeric plus 2 decimals
Pressure Plate Used	Indication of whether a pressure plate was used (0=no, 1=yes).	1 digit character
Club Stick Used	Indication of whether a club stick was used (0=no, 1=yes).	1 digit character
Twine Top Mesh Size	Size of mesh opening (0=no twine top used).	3 digit numeric plus 1 decimal
Twine Top Mesh Type	Type of mesh used in the twine top (1=square, 2=diamond).	1 digit character
Twine Top Measurement Type	Type of mesh measurement (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Twine Top Height in Meshes	Number of meshes in length.	2 digit numeric
Twine Top Width in Meshes	Number of meshes in width.	2 digit numeric
Twine Top Height in Rings	Number of rings in length.	2 digit numeric
Twine Top Width in Rings	Number of rings in width	2 digit numeric
Number of Rock Chains	Number of rock chains used (0=none used).	2 digit numeric
Number of Tickler Chains	Number of tickler chains (0=none used).	2 digit numeric
Chain Bag Used	Indication of whether a chain bag was used (0=no, 1=yes).	1 digit character
Chaffing Gear Used on Chain	Indication of whether chaffing gear was used (0 = no, 1=yes).	1 digit character
Average Number of Links Between Rings in Chain	Number of links between rings.	1 digit numeric
Inside Chain Ring Size (top of bag)	Inside diameter of rings in inches.	2 digit numeric plus 2 decimals

Table 8.L. (cont'd)		
Table 26(cont'd).tab		
Data Element	Description / Criteria	Format
Inside Chain Ring Size (bottom of bag)	Inside diameter of rings in inches.	2 digit numeric plus 2 decimals
Chain Length	Number of rings from clubstick or terminal end of dredge to dredge frame.	3 digit numeric
Mesh Bag Chaffing gear used	Indication of whether chaffing gear was used (0=no, 1=yes).	1 digit character
Mesh Bag Mesh Size	Size of mesh (0=no mesh bag used).	3 digit numeric plus 2 decimals
Mesh Bag Mesh Type	Type of mesh used in the mesh bag (1=square, 2=diamond).	1 digit character
Mesh Bag Measurement Type	Type of mesh measurement (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Mesh Bag Length	Number of meshes in length.	2 digit numeric
Mesh Bag Circumference	Number of meshes in fishing circle.	3 digit numeric
Gear Characteristics for Hydraulic Escalator Dredge		
Pump Capacity	Horsepower of pump.	3 digit numeric
Intake or Suction Hose	Inside diameter of intake or suction hose in millimeters.	2 digit numeric plus 1 decimal
Pressure Hose	Inside diameter of pressure hose in millimeters.	2 digit numeric plus 1 decimal
Pressure Manifold or Head	Width between inside edge of sled runners in inches.	3 digit numeric
Number of Nozzles on Manifold	Number of nozzles on manifold.	2 digit numeric
Diameter of Nozzles	Inside diameter of nozzles in millimeters.	2 digit numeric plus 1 decimal
Length of Nozzles	Length of nozzles in feet from point of attachment on manifold to opening of nozzle.	2 digit numeric plus 1 decimal
Angle of Nozzle Attachment	Angle of nozzle measured from horizontal.	2 digit numeric
Overall Length of Conveyor	Overall length of conveyor in feet measured from manifold to other end of conveyor belt where it reverses direction.	2 digit numeric plus 1 decimal
Text Field	Comments or uncoded data	Text

Specific gear data elements for cast net fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics		
Mesh size	Size of opening of largest mesh.	4 digit numeric
Mesh Type	Type of mesh used in net (1=square, 2=diamond).	1 digit character
Mesh Measurement Type	Type of mesh measure (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Number of weights	Number of weights on the net.	2 digit numeric
Individual Weight	Individual weight of lead line weights in ounces.	2 digit numeric plus 2 decimals

Table 8.M. (cont'd)		
Data Element	Description / Criteria	Format
Twine material	Type of twine material (1=mono, 2=multi).	1 digit character
Breaking strength	Pound test of twine.	2 digit numeric plus 2 decimals
Radius of gear	Radius of gear in feet.	2 digit numeric plus 2 decimals
Modification	Are any modifications made to gear (strengtheners, etc) (0=no, 1=yes).	1 digit character
Description	Description of modifications.	50 character text
Text Field	Comments or uncoded data	Text

Table 8.N. Specific gear data elements for fixed net (pound nets, weirs, etc.) fisheries (to be collected through a gear log and linked to the haul log - Table 8.H).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics-Bottom Staked Pound/Fyke & Hoop Nets (including floating trap nets)		
Pound/Bowl Shape	Geometric shape of pound/bowl (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	1 digit character
Length/Diameter of Pound/Bowl	Length/diameter of gear in feet.	2 digit numeric
Width	Width of gear in feet.	2 digit numeric
Mesh Size	Predominant mesh size.	3 digit numeric plus 1 decimal
Twine Size	Predominant twine size.	3 digit numeric (Table A.11, Program Design for conversions)

Table 8.N. (cont'd)		
Data Element	Description / Criteria	Format
Pound/Bowl Material	Predominant construction material (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Height of Pound	Height of pound in feet.	3 digit numeric
Number of Pounds	Number of pounds, hoops etc.	1 digit numeric
Bait Used (if applicable)	Bait used in the pound (i.e hoop nets used for shrimp).	ITIS11 digit character (Table A.8, Program Design)
Anchoring Method	Method of anchoring the net (1=stakes, 2=anchors) .	1 digit character
Number of Pound Escape Vents	Total number of escape vents.	2 digit numeric
Geometric Shape of Pound Escape Vent	Geometric shape of pound escape vent (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	1 digit character
Pound Escape Vent Length	Total length of pound escape vent in feet.	2 digit numeric
Pound Escape Vent Width	Total width of pound escape vent in feet.	2 digit numeric
Location of Pound Escape Vent	Location of pound escape vent.	2 digit character
Pound Biodegradable Panel Attachment Type	Predominant type of degradable material used (0=none used, 1=iron hogrings, 2=degradable plastic, 3=softwood lathe, 4=uncoated wire).	1 digit character
Leader Inshore Mesh Size	Predominant mesh size at nearshore end of net.	3 digit numeric plus 1 decimal
Leader Trap Mesh Size	Predominant mesh size at trap entrance.	3 digit numeric plus 1 decimal
Leader Inshore Twine Size	Predominant twine size at nearshore end.	3 digit numeric (Table A.11, Program Design for conversions)
Leader Trap Twine Size	Predominant twine size at trap entrance.	3 digit numeric (Table A.11, Program Design for conversions)
Leader Material	Predominant construction material of leader (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Leader Length	Total length of leader in feet.	4 digit numeric

Table 8.N. (cont'd)		
Data Element	Description / Criteria	Format
Leader Inshore Depth	Depth of leader at nearshore end, in feet.	2 digit numeric
Leader Trap Depth	Depth of leader at trap entrance in feet (also end of leader).	2 digit numeric
Leader Anchoring Material	Method of anchoring the net.	1 digit character
Heart Length/Diameter	Length/diameter of heart in feet.	2 digit numeric
Heart Width	Width of heart in feet.	2 digit numeric
Heart Mesh Size	Predominant mesh size in heart.	3 digit numeric plus 1 decimal
Heart Twine Size	Predominant twine size in heart.	3 digit numeric (Table A.11, Program Design for conversions)
Heart Material	Predominant construction material of heart.	1 digit character
Heart Anchoring Method	Method of anchoring heart.	2 digit character
Wing Inshore Mesh Size	Predominant mesh size at nearshore end of net.	3 digit numeric plus 1 decimal
Wing Trap Mesh Size	Predominant mesh size at trap entrance.	3 digit numeric plus 1 decimal
Wing Inshore Twine Size	Predominant twine size at nearshore end.	3 digit numeric (Table A.11, Program Design for conversions)
Wing Trap Twine Size	Predominant twine size at trap entrance.	3 digit numeric (Table A.11, Program Design for conversions)
Wing Material	Predominant construction material of leader (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Wing Length	Total length of wing in feet.	4 digit numeric
Wing Inshore Depth	Depth of leader at nearshore end of net in feet.	2 digit numeric
Wing Trap Depth	Depth of leader at trap entrance in feet (also end of leader).	2 digit numeric
Number of Wings	Total number of wings in the net.	2 digit numeric
Wing Anchoring Material	Method of anchoring the wings.	1 digit character
Text Field	Comments or uncoded data	Text

Table 8.O. Specific gear data elements for haul seine fisheries (to be collected through a gear log and linked to the haul log - Table 8.H).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics- Haul nets		
Net Far End Mesh Size	Predominant mesh size at the far end of the net.	3 digit numeric plus 1 decimal
Net Pocket Mesh Size	Predominant mesh size at the pocket.	3 digit numeric plus 1 decimal
Net Far End Twine Size	Predominant twine size at the far end of the net.	3 digit numeric (Table A.11, Program Design for conversions)
Net Pocket Twine Size	Predominant twine size at the pocket.	3 digit numeric (Table A.11, Program Design for conversions)

Table 8.O. (cont'd)		
Data Element	Description / Criteria	Format
Net Material	Predominant construction material of the net (00=unknown, 01=nylon, 02=poly, 03=Kevlar, 04=Spectra, 05=Tenex, 06=Nomex, 98=combination, 99=other).	1 digit character
Net Length	Total length of the leader in feet.	4 digit numeric
Net Depth	Depth at the ends of the wings in feet.	2 digit numeric
Pocket Shape	Geometric shape of pound/bowl (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other). .	1 digit character
Pocket Length/Diameter	Length/diameter of the pocket in feet.	4 digit numeric
Pocket Width	Width of the pocket in feet.	2 digit numeric
Pocket Depth	Depth of the pocket in feet.	2 digit numeric
Pocket Mesh Size	Predominant mesh size of the pocket.	3 digit numeric plus 1 decimal
Pocket Twine Size	Predominant twine size of the pocket.	3 digit numeric (Table A.11, Program Design for conversions)
Text Field	Comments or uncoded data	Text

Table 8.P. Specific gear data elements for pot and trap fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit
Gear Characteristics		
Number of Pots	Number of pots per haul.	3 digit numeric
Geometric Shape	Geometric shape of pots (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	2 digit character
Frame Primary Construction Material	Primary material (1=wood, 2=wire, 3=plastic, 9=other).	2 digit character
Mesh Size	Mesh size of the pot or trap.	2 digit numeric plus 2 decimals
Top Length	Length of the top of the predominant pot in whole inches.	2 digit numeric
Top Width	Width of the top of the predominant pots in whole inches.	2 digit numeric
Bottom Length	Length of the bottom of the predominant pot in whole inches.	2 digit numeric
Bottom Width	Width of the bottom of the predominant pots in whole inches.	2 digit numeric

Table 8.P. (cont'd)		
Data Element	Description / Criteria	Format
Height	Height of the predominant pots in whole inches.	2 digit numeric
Distance Between Pots	Average distance between pots in feet.	2 digit numeric
Number of Entrances	Number of entrances to the pot or trap.	1 digit numeric
Geometric Shape of Entrance	Geometric shape of the entrance (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	2 digit character
Length of Entrance	Length of the entrance in inches.	2 digit numeric
Width of Entrance	Width of the entrance in inches.	2 digit numeric
Location of Entrance	Location of the entrance.	2 digit character
Number of Escape Vents	Number of escape vents.	1 digit numeric
Geometric Shape of Escape Vents	Geometric shape of escape vents (0=unknown, 1=rectangular, 2=round/oval, 3=1/2 round, 4=cone, 5=trapezoid, 6=square, 7=diamond, 8=triangular, 9=other).	2 digit character
Length/Diameter of Escape Vents	Length of escape vents in inches.	2 digit numeric
Width of Escape Vents	Width of escape vents in inches.	2 digit numeric
Location of Escape Vents	Location of escape vents.	2 digit character
Use of Biodegradable Panel	Is a biodegradable panel used (0=no, 1=yes).	1 digit character
Attachment Type	Type of attachment of biodegradable panel.	1 digit character
Bait	Predominant type of bait used.	ITIS11 digit character (Table A.8, Program Design)
Buoy Line Material	Predominant type of line material (need to develop list of materials).	2 digit numeric
Buoy Line Diameter	Predominant line diameter in millimeters.	1 digit numeric plus 2 decimals
Trot Line Material	Predominant type of line material (need to develop list of materials).	2 digit character
Trot Line Diameter	Predominant line diameter in millimeters.	1 digit numeric plus 2 decimals
Text Field	Comments or uncoded data	Text

Specific gear data elements for purse seine fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.)

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics		
Float Line Length	Length of floatline in feet.	4 digit numeric
Float Line Diameter	Diameter of floatline in millimeters.	2 digit numeric plus 2 decimals
Lead Line Length	Length of lead line in feet.	4 digit numeric
Lead Line Diameter	Diameter of lead line in millimeters.	2 digit numeric plus 2 decimals
Lead Line Weight	Total estimated weight of lead line in pounds.	4 digit numeric plus 2 decimals
Type of Hauling Device	Device used to haul the net in (1=power block, 2=triplex, 3=drum, 9=other, 8=unknown).	1 digit numeric

Table 8.Q. (cont'd)		
Data Element	Description / Criteria	Format
Ring type	Type of ring used to hold purse line (1=round, 2=snap, 3=combo, 9=other).	1 digit character
Ring Material	Material from which rings are constructed (1=steel, 2=iron, 3=alloy, 4=stainless, 5=combo, 9=other).	1 digit character
Net Material	Material used in net, excluding bunt (1=nylon, 2=poly, 3=Kevlar, 4=Spectra, 9=other).	1 digit character
Net Length	Total length of net in feet.	4 digit numeric
Net Depth	Depth of net in feet.	3 digit numeric
Net Twine Size	Diameter of twine in millimeters.	2 digit numeric plus 1 decimal (Table A.11, Program Design for conversions)
Tom Weight	Additional total weight on the purse line in pounds used to control the depth of the purse line.	4 digit numeric (0=none)
Net Mesh Size	Size of mesh in the net.	3 digit numeric plus 2 decimals
Net Mesh Type	Type of mesh used in the net (1=square, 2=diamond).	1 digit character
Net Mesh Measurement Type	Type of mesh measurement (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Sack/Bunt Material	Material used in net, excluding bunt (1=nylon, 2=poly, 3=Kevlar, 4=Spectra, 9=other).	1 digit character
Sack/Bunt Length	Total length of sack/bunt in feet.	4 digit numeric
Sack/Bunt Depth	Depth of sack/bunt in feet.	3 digit numeric
Sack/Bunt Mesh Size	Size of mesh in the sack/bunt.	3 digit numeric plus 2 decimals
Sack/Bunt Mesh Type	Type of mesh used in the sack/bunt (1=square, 2=diamond).	1 digit character

Table 8.Q. (cont'd)		
Table 31 (cont'd).		
Data Element	Description / Criteria	Format
Sack/Bunt Mesh Measurement Type	Type of mesh measurement (1=stretched center knot to center knot, 2=stretched inside measure, 3=bar).	1 digit character
Sack/Bunt Twine Size	Diameter of twine in sack/bunt in millimeters.	2 digit numeric plus 1 decimal (Table A.11, Program Design for conversions)
Chase Boat Horsepower	Total horsepower of the boat.	3 digit numeric
Chase Boat Gross Tonnage	Gross tonnage of the boat.	3 digit numeric
Chase Boat Length	Total length of the chase boat in feet.	2 digit numeric
Text Field	Comments or uncoded data	Text

Specific gear data elements for rake/hoe/tong fisheries (to be collected through a gear log and linked to the haul log - Table 8.H.).

Data Element	Description / Criteria	Format
Header Information		
Observer Identification Number	Unique certification number provided by the ACCSP at-sea observer training program.	To be developed
Trip Unique Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information).	21 digit character
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Unloading Date	The date of unloading at the dealer (may be more than one unloading date per trip).	MM/DD/YYYY
Gear Information		
Gear Code	The type of gear used to catch the marine resource.	3 digit character (Table A.4, Program Design)
Gear Number	Consecutive number assigned to each uniquely configured gear hauled and for which characteristics are described.	2 digit character
Gear Characteristics- Rakes/Tongs/Hoes		
Operating Mechanism	Method of operation (1=mechanical, 2=hand, 3=hydraulic, 4 = sail).	2 digit character
Shaft Length	Length of shaft/handle in feet.	2 digit numeric
Width	Width of entire tongs, rakes, hoes in inches.	2 digit numeric
Length of Tines/Teeth	Length of tines/teeth in inches.	2 digit numeric plus 2 decimals
Spacing of Tines/Teeth	Spacing of tines/teeth in inches.	2 digit numeric plus 2 decimals
Bar Spacing	Bar spacing in inches.	2 digit numeric plus 2 decimals
Weight of Tongs	Total weight of tongs in pounds.	2 digit numeric
Text Field	Comments or uncoded data	Text

Minimum standard data elements to be collected through the ACCSP at-sea observer program for collection of quantitative release, discard, and protected species interactions data for the for-hire fisheries.

Data Element	Description / Criteria	Format
Vessel Information		
Vessel Identifier	Unique vessel identifier (Coast Guard or state registration number). These identifiers must be trackable through time and space.	11 digit character
Vessel Name	Name of vessel.	20 digit character
Fishing Party Size	Number of fishermen in the party.	3 digit numeric
Actual Number of Anglers Fishing	Number of anglers actually fishing on the vessel.	3 digit numeric
Individual Identifier	An identifier unique to an individual (i.e. operator license number) traceable through time and space.	11 digit character
Individual Operator	Name of vessel owner/operator	30 digit character
Trip Information		
Form Type/Version Number	Version identification number for the ACCSP reporting form.	12 digit alphanumeric
Trip start	Date the trip started (this is unique to each trip and can be used to tie multiple unloadings into a trip record). A trip is shore to shore by gear/area combination, or in the case of transfers at sea, an off-loading at sea is a trip. This information should include trips with effort but no catch.	MM/DD/YYYY
Trip Number	Sequential number representing the number of trips taken in a single day by either a vessel or individual. The trip number will default to "one" when only a single trip is conducted.	2 digit character
Time left dock	The time the vessel left the dock	MO:DD:HH:MM
Time returned	The time the vessel returned to the dock.	MO:DD:HH:MM
Drop Information		
Trip Identifier	Trip start, vessel or individual identifier, and trip number (see vessel and trip information)	21 digit character
Drop Number	Sequential number for unique location / gear taken in a single trip.	3 digit character
Drop Observed	Indication of whether the drop was actually observed (0=no, 1=yes).	1 digit character
Lat Begin	The latitude at the beginning of the drop.	6 digit numeric plus 1 character (2 decimal minutes)

Table 8.S. (cont'd)		
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Table 33 (cont'd).Table		
Data Element	Description / Criteria	Format
Long Begin	The longitude at the beginning of the drop.	7 digit numeric plus 1 character (2 decimal minutes)
Lat End	The latitude at the end of the drop.	6 digit numeric plus 1 character (2 decimal minutes)
Long End	The longitude at the end of the drop.	7 digit numeric plus 1 character (2 decimal minutes)
Fishing Method	Type of fishing method used (i.e., bottom, troll, surface, fly, drift, chumming, midwater).	3 digit character
Distance from Shore	The distance from shore where fishing occurred [inland (less than 0 nautical miles...nm), nearshore (0-3 nm on Atlantic coast, 0-9 nm on Florida and Texas Gulf coast), EEZ (3-200 nm on Atlantic coast, 9-200 nm on Florida and Texas Gulf coast), territorial seas (in the USVI and Puerto Rico (12 nm), and international (>200 nm)] is embedded in this code. (See Table A.3. and area figures when revised).	1 digit character (Table A.3, Program Design.)
Start Time	The time the captain indicates that fishing can begin. Used with time gear retrieved to derive fishing time.	MO:DD:HH:MM
Stop Time	The time that the captain indicates to haul in fishing lines. Used with time set to derive fishing time.	MO:DD:HH:MM
Depth Fished	Depth at which the gear is fished (fathoms) (1 = surface, 2 = midwater, 3 = bottom).	1 digit character
Minimum Bottom Depth	Minimum depth of bottom in fathoms.	4 digit numeric plus 1 decimal point
Maximum Bottom Depth	Maximum depth of bottom in fathoms.	4 digit numeric plus 1 decimal point

Subsample Log		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character

Table 8.S. (cont'd)		
Data Element	Description / Criteria	Format
Drop Number	Sequential number for unique location / gear taken in a single trip.	3 digit character
Species	The species for each species of marine resources landed, sold, released, discarded, etc. Each species is to be identified separately. Use of market or generalized categories is to be avoided within species code fields or variables.	ITIS11 digit character (Table A.8, Program Design)
Disposition	Fate of the catch (i.e. releases, discards, bait, industrial use, personal consumption, protected species interactions, etc.). Disposition of releases and discards should be recorded (i.e. regulatory versus other releases and discards, dead or alive).	3 digit character (Table A.5, Program Design)
Quantity Observed (Replaces Quantity Kept)	The amount, in numbers, of each marine species recorded by a trained observer.	4-digit numeric
Quantity Reported (Replaces Quantity Kept)	The amount, in numbers, of each marine species reported by fishermen	4 digit numeric
Estimated or Actual	How was quantity collected (1=actual, 2=estimated).	1 digit character
<i>Biological Data Information</i>		
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information)	21 digit character
Drop Number	Sequential number for unique location / gear taken in a single trip.	3 digit character
Species	The species for each species of marine resources landed, sold, released, discarded, protected species, etc. Each species is to be identified separately. Use of market or generalized categories is to be avoided within species code fields or variables.	ITIS11 digit character (Table A.8, Program Design)
Minimum Data for Marine Mammals		
Species	Species of marine mammals observed	ITIS 11 digit character (Table A.8, Program Design)
Photo(s)	Were photos taken? (0=no; 1=yes) Photo should include the tag number and trip identifier, where applicable.	1 character numeric

Table 8.S. (cont'd)		
Table 33 (cont'd).		
Data Element	Description / Criteria	Format
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied. (0=unknown; 1=taken without tag, then tagged; 2=taken without tag, and not tagged; 3=taken with a tag, and retagged; 4=taken with a tag, and not retagged).	1 digit character
Length	Straight measurement as per protocols.	10 digit numeric
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program design)
Length Type	Indicate whether length was measured or estimated (0=actual; 1=estimated)	1 digit character
Gender	Gender of the species (1=male, 2=female, 3=unknown).	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text
Minimum Data for Sea Turtles		
Species	Species of sea turtles observed	ITIS 11 digit character (Table A.8, Program Design)
Photo(s)	Were photos taken? (0=no; 1=yes) Photo should include the tag number and trip identifier, where applicable.	1 digit character
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Indicate whether length was measured or estimated (0=actual; 1=estimated)	1 digit character
Width Type	Indicate whether width was measured or estimated (0=actual; 1=estimated)	1 digit character

Table 8.S. (cont'd) Table 33 (cont'd).Tfsfe		
Data Element	Description / Criteria	Format
Straight Carapace Length	Straight length of carapace from notch to notch (requires use of calipers)	5 digit numeric
Curved Carapace Length	Curved length of carapace from notch to notch (requires use of flexible measuring tape)	5 digit numeric
Straight Carapace Width	Straight width of carapace from notch to notch (requires use of calipers)	5 digit numeric
Curved Carapace Width	Curved width of carapace from notch to notch (requires use of flexible measuring tape)	5 digit numeric
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text
Minimum Data for Fish and Crustaceans		
Species	Species of fish/crustaceans observed	ITIS 11 digit character (Table A.8, Program Design)
Trip Identifier	Trip start, vessel or individual identifier and trip number (see vessel and trip information).	21 digit character
Photo	Were photos taken? (0=no; 1=yes) Photo should include the tag number and trip identifier, where applicable.	1 digit character
Length	Length measurement in millimeters as per protocols.	10 digit numeric
Units of Measurement	Units of length (i.e., feet, meters, etc.).	2 digit character (Table A.3, Program Design)
Length Type	Type of length measurement (standard, total, etc).	2 digit character Table A.3, Program Design)
Gender	Gender of the species (1=male, 2=female, 3=unknown).	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Trip Identifier	Trip start, vessel, or individual identifier and trip number (see vessel and trip information)	21 digit character
Species	Bird species observed	ITIS 11 digit character (Table A.8, Program Design)
Photo	Were photos taken? (0=no; 1=yes) Photo should include the tag number and trip identifier, where applicable.	1 digit character
Tag ID Number(s)	All letters and numbers on pre-existing or newly applied tags.	12 digit character
Tag Code(s)	Indication of whether the tag is pre-existing or newly applied.	1 digit character

Table 8.S. (cont'd) Table 33 (cont'd).Tfsfe		
Minimum Data for Birds		
Data Element	Description / Criteria	Format
Gender	Gender of the species (1=male, 2=female, 3=unknown).	1 digit character
Age Class	Indication of age class (1=immature, 2=mature, 3=unknown).	1 digit character
Were biological samples taken?	Indication of whether biological samples were taken (0=no, 1=yes).	1 digit character
Text Field	Comments or uncoded data	Text

TABLE 8.T. ACCSP release/discard prioritization process for identifying Atlantic coast commercial, recreational and for-hire fisheries requiring collection of more detailed gear configuration data or collection of release/discard data at a more detailed level of resolution.

Activity	Specific Task
Characterize Atlantic coast fisheries	Compile information on commercial and fisheries, including release/discard activities. Annually update information.
Annually review documentation	Fisheries characterization information qualitative and quantitative data obtained through the at-sea observer, strandings, entanglements, fishermen reporting, and port interviewing programs target sampling levels for biological sampling based on recommendations from the Biological Review Panel
Identify problem areas and make recommendations	Based on annual data review, develop recommendations and modifications which may include: increase sampling levels collection of more detailed gear configuration information collection of data at a more detailed level of resolution (set/tow) collection of intensive biological samples
Implementation	Implement recommended modifications to existing at-sea observer programs and other quantitative release/discard monitoring programs.